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(71) Applicant: **ELI LILLY AND COMPANY**
Indianapolis, Indiana 46285 (US)

(72) Inventors:
- **Dehoff, Bradley Stuart**
  Indianapolis, Indiana 46214 (US)
- **Kuhstoss, Stuart Allen**
  Indianapolis, Indiana 46256 (US)
- **Rosteck, Paul Robert, Jr.**
  Indianapolis, Indiana 46237 (US)
- **Sutton, Kimberly Lynn**
  New Palesatine, Indiana 46163 (US)

(74) Representative: **Tapping, Kenneth George**
Lilly Industries Limited
European Patent Operations
Erl Wood Manor
Windlesham Surrey GU20 6PH (GB)

(54) Polyketide synthase genes

(57) A DNA molecule isolated from *Streptomyces fradiae* encodes the multi-functional proteins which direct the synthesis of the polyketide tylactone.

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Description

The present invention relates to DNA molecules responsible for encoding the multi-functional proteins that direct the biosynthesis of polyketide compounds, the products encoded by said DNA molecules, recombinant DNA expression vectors, and transformed microbial host cells.

Polyketides are a family of compounds that include a large number of structurally and functionally diverse natural products. For example, the polyketides provide the structural backbone for compounds that exhibit a variety of biological activities, such as, antibiotic, antitumor, and immunosuppressive agents.

Although the polyketides are quite diverse as indicated, they share a common mechanistic scheme of biosynthesis. The polyketides are synthesized by the successive condensation of small carboxylic acid residues followed by variable reduction steps at the resulting β-keto carbon (i.e., β-carbonyl) moiety in a process that is similar to the synthesis of fatty acids. The iterative synthetic process for many of these polyketides is controlled by a complex of large, multi-functional polypeptides that have distinct sites for the variety of activities that are required.

The general scheme for polyketide biosynthesis has been reviewed, for example, in Hopwood and Sherman, Annu. Rev. Genet., 1990, 24:37 and Katz and Donadio, Annu. Rev. Microbiol., 1993, 47:875.

Naturally-occurring DNA sequences that encode the polyketide synthase enzymes have generally been found to be organized into repeated subunits, or modules, each of which encodes all the activities required in a single round of synthesis, which includes the condensation step itself and the post-condensation processing steps. Each activity is associated with a distinct site, which contributes to the specificity for the particular carboxylic acid building block that is incorporated at each condensation step, or which dictates the particular post-condensation processing functions that will be executed.

For example, PCT publication WO 93/13663 describes the organization of the gene encoding the polyketide synthase of *Saccharopolyspora erythraea*. The gene is organized in modules, with each module effecting one condensation step. The precise sequence of chain growth and the processing of the growing chain is determined by the genetic information in each module. This PCT application describes an approach for synthesizing novel polyketide structures by manipulating in several ways the DNA governing the biosynthesis of the cyclic lactone framework. In order to adapt this methodology to other polyketides, however, the DNA molecules directing the biosynthetic processing must first be isolated.

The present invention is directed to the DNA sequence for the gene cluster responsible for encoding tylactone synthase, the building machinery of tylactone, which is the basic building block of tylosin. As a result, the present invention enables modification of the DNA sequence so as to alter the type of carboxylic acids incorporated, the number of carboxylic acids incorporated, the post-condensation reactions performed, or any combination thereof, thereby resulting in novel tylosin-related polyketides.

The present invention provides a DNA molecule comprising an isolated DNA sequence that encodes a tylactone synthase domain. Thus, the present invention provides the DNA molecule of SEQ ID NO:1 and DNA molecules that contain submodules thereof. The present invention also provides the products encoded by said DNA molecules, recombinant DNA expression vectors, and transformed microbial host cells.

Figure 1 is a map of the tylactone polyketide synthase region *(tylG)* of the *Streptomyces fradiae* DNA (~45 kb). Distances in kb are relative to the beginning of *tylG*. Open reading frames (ORFs) are indicated by arrows. Restriction sites are denoted as follows:

E - *Eco*RI
B - *Bam*HI

Predicted functional domains are labeled as follows:

ACP - acyl carrier protein
AT - acyltransferase
DH - dehydratase
ER - enoylreductase
KR - ketoreductase
KR' - ketoreductase-like domain predicted to be inactive
KS - ketosynthase
KS' - ketosynthase-like domain in which a glutamine residue is present in the position occupied by an active site cysteine in a normal ketosynthase
TE - thioesterase.

Figure 2 depicts the biosynthetic pathway for tylactone synthesis.

Figure 3 is a map of the two clones that span the whole region of the *tylG* DNA.

Figure 4 is a map of the *srmG* region of the *Streptomyces ambofaciens* DNA. Distances in kb are relative to the beginning of *srmG*. Open reading frames are indicated by arrows. The *srmG* DNA (0-42 kb) is the platenolide polyketide synthase region. Restriction sites are denoted as above with additions as follows:

AP - *ApaI*
G - *BglI*
K - *KpnI*
P - *PstI*
X - *XhoI*

Predicted functional domains are labeled as above.

Figure 5 demonstrates the biosynthetic pathway for platenolide synthesis.

Figure 6 is a map of the two clones that span the whole region of the *srmG* DNA.

Polyketides are a large class of structurally and functionally diverse natural products. A common feature of compounds in this class is that their synthesis is accomplished under the direction of a complex of multi-functional peptides, termed a "polyketide synthase." Molecular genetic analysis of polyketide synthase genes has revealed two distinct classes of enzymes operating for different polyketides: 1) the aromatics, which are made through an essentially iterative process, and 2) the complex polyketides, which comprise several repeats of the same activities arranged in few very large polypeptides.

Among the complex polyketide synthase genes, a polyketide synthase includes enzymatic and regulatory activities responsible for exercising substrate specificity, catalyzing the condensation of small carboxylic acid building blocks (in the form of coenzyme A thioesters) to a growing polyketide carbon chain, and catalyzing the post-condensation processing reactions at the β-carbonyl functional group that results from the condensation reaction.

The condensation reaction requires several activities including acyl carrier protein (ACP), β-ketosynthase (KS), and acyltransferase (AT). Once a condensation has occurred, the resulting β-carbonyl functional group may be modified. Post-condensation activities that may be involved include β-ketoreductase (KR), dehydratase (DH), and enoylreductase (ER). Polyketide biosynthesis is terminated by a thioesterase (TE) activity. Whether all, some, or none of these activities act after a particular condensation step determines the structure of the final product.

The present invention provides, in particular, the DNA sequence encoding the polyketide synthase responsible for biosynthesis of tylactone, i.e., tylactone synthase. Tylactone itself is the polyketide backbone of the commercially significant antibiotic tylosin. The tylactone synthase DNA sequence, which defines the tylactone synthase gene cluster, directs biosynthesis of the tylactone polyketide by encoding the various distinct activities of tylactone synthase.

The gene cluster for tylactone synthase, like other complex polyketide biosynthetic genes whose organization has been elucidated, is characterized by the presence of several open reading frames (ORFs), each of which contains one or more repeated units termed "modules." A module is defined as the genetic element encoding all of the distinct activities required in a single round of synthesis, i.e., one condensation step and all the β-carbonyl processing steps associated therewith. Each module encodes an ACP, a KS, and an AT activity to accomplish the condensation portion of the synthesis, and selected post-condensation activities to effect β-carbonyl processing. The polypeptides encoded by such modules are termed "synthase units" (SUs).

Each module is further characterized by the inclusion of submodules that are responsible for encoding the distinct activities of tylactone synthase. For purposes of the present invention, the term "submodule" is defined as the portion of the polyketide synthase DNA sequence that encodes a distinct activity, or "domain". Thus, a domain is taken as commonly understood to mean that part of the polyketide synthase polypeptide necessary for a given distinct activity.

Organization of the tylactone synthase gene cluster derived from *Streptomyces fradiae,* is shown in Figure 1. The tylactone synthetic pathway, with indications of the specific carboxylic acid substrates used for each condensation reaction and the various post-condensation activities, is shown in Figure 2.

A preferred DNA molecule comprising the tylactone synthase gene cluster isolated from *Streptomyces fradiae* is represented by SEQ ID NO:1. Other preferred DNA molecules of the present invention include the various open reading frames of SEQ ID NO:1 that encode individual multi-functional polypeptides. These are represented by the following nucleotide residues of SEQ ID NO:1: ORF1 816 to 14234, ORF2 14351 to 19945, ORF3 20010 to 31199, ORF4 31232 to 36067, and ORF5 36249 to 41774. The predicted amino acid sequences of the various peptides encoded by these sequences are shown in SEQ ID NO:2, 3, 4, 5, and 6, respectively.

Yet other preferred DNA molecules of the present invention include the modules that encode the synthase units, which include all the activities necessary for a single round of synthesis. These are represented by the following nucleotide residues of SEQ ID NO:1: Starter Module 942 to 3929, Module 1 3993 to 8471, Module 2 8541 to 13970, Module 3 14411 to 19666, Module 4 20136 to 24611, Module 5 24675 to 30902, Module 6 31337 to 35743, and Module 7 36360 to 40826. The predicted amino acid sequences of the various synthase units encoded by these modules are

represented, respectively, by the following amino acid residues: Starter SU 43 to 1038, SU1 1060 to 2552 and SU2 2576 to 4385 in SEQ ID NO:2; SU3 21 to 1772 in SEQ ID NO:3; SU4 43 to 1534 and SU5 1556 to 3631 in SEQ ID NO:4; SU6 36 to 1504 in SEQ ID NO:5; and SU7 38 to 1526 in SEQ ID NO:6.

Still other preferred DNA molecules include the various submodules that encode the various domains of tylactone synthase. These submodules are represented by the following nucleotide residues: KS^Q(s) 942 to 2156, AT(s) 2571 to 3557, ACP(s) 3675 to 3929, KS1 3993 to 5264, AT1 5631 to 6617, KR1 7410 to 7949, and ACP1 8220 to 8471 of Module 1 in SEQ ID NO:1; KS2 8541 to 9812, AT2 10260 to 11246, DH2 11319 to 11876, KR2 12861 to 13415, and ACP2 13719 to 13970 of Module 2 in SEQ ID NO:1; KS3 14411 to 15697, AT3 16055 to 17122, DH3 17198 to 17794, KR3 18584 to 19138, and ACP3 19415 to 19666 of Module 3 in SEQ ID NO:1; KS4 20136 to 21404, AT4 21771 to 22757, KR'4 23541 to 24077, and ACP4 24360 to 24611 of Module 4 in SEQ ID NO:1; KS5 24675 to 25949, AT5 26292 to 27284, DH5 27360 to 27917, ER5 28767 to 29813, KR5 29829 to 30368, and ACP5 30651 to 30902 of Module 5 in SEQ ID NO:1; KS6 31337 to 32608, AT6 32975 to 33961, KR6 34694 to 35236, and ACP6 35492 to 35743 of Module 6 in SEQ ID NO:1; KS7 36360 to 37631, AT7 37989 to 38987, KR7 39759 to 40313, ACP7 40575 to 40826, and TE7 41235 to 41333 of Module 7 in SEQ ID NO:1.

The predicted amino acid sequences of the various domains encoded by these submodules are represented, respectively, by KS^Q(s) 43 to 447, AT(s) 586 to 914, ACP(s) 954 to 1038, KS1 1060 to 1483, AT1 1606 to 1934, KR1 2199 to 2378, and ACP1 2469 to 2552 in SEQ ID NO:2; KS2 2576 to 2999, AT2 3149 to 3477, DH2 3502 to 3687, KR2 4016 to 4200, and ACP2 4302 to 4385 in SEQ ID NO:2; KS3 21 to 449, AT3 569 to 924, DH3 950 to 1148, KR3 1412 to 1596, and ACP3 1689 to 1772 in SEQ ID NO:3; KS4 43 to 465, AT4 588 to 916, KR'4 1178 to 1356, and ACP4 1451 to 1534 in SEQ ID NO:4; KS5 1556 to 1980, AT5 2095 to 2425, DH5 2451 to 2636, KR5 3274 to 3453, and ACP5 3548 to 3631 in SEQ ID NO:4; KS6 36 to 459, AT6 582 to 910, KR6 1155 to 1335, and ACP6 1421 to 1504 in SEQ ID NO:5; KS7 38 to 461, AT7 581 to 913, KR7 1171 to 1355, ACP7 1443 to 1526, and TE7 1663 to 1695 in SEQ ID NO:6.

Although not wishing to be bound to any particular technical explanation, sequence similarity exists among domain boundaries in various polyketide synthase genes. Thus, one skilled in the art is able to predict the domain boundaries of newly discovered polyketide synthase genes based on the sequence information of known polyketide synthase genes. In particular, the boundaries of submodules, domains, and open reading frames in the instant application are predicted based on sequence information disclosed in the instant application and the locations of the domain boundaries of the erythromycin polyketide synthase (Donadio et al., Gene 111:51 (1992)).

The DNA sequence of the tylactone synthase gene was determined from recombinant DNA clones prepared from the DNA of *Streptomyces fradiae*. The tylactone synthase gene is contained in recombinant DNA vectors pSET506 and pSET507 (Figure 3), which are available from the National Center for Agricultural Utilization Research, 1815 North University Street, Peoria, Illinois 61604-3999, in *E. coli* K12 MM294 under accession numbers NRRL B-18688 (deposited July 19, 1990) and NRRL B-18689 (deposited July 19, 1990), respectively.

Tehcniques for isolating bacterial DNA are readily available and well known in the art. Any such technique can be employed in this invention. In particular, DNA from these cultures is isolated as follows. Lyophils of *E. coli* K12 MM294/pSET506 or *E. coli* K12 MM294/pSET507 are plated onto L-agar (10 g tryptone, 10 g NaCl, 5 g yeast extract, and 15 g agar per liter) plates containing 100 μg/ml ampicillin to obtain a single colony isolate of the strain. This colony is used to inoculate about 500 ml of L-broth (10 g tryptone, 10 g NaCl, 5 g yeast extract per liter) containing 100 μg/ml ampicillin, and the resulting culture is incubated at 37° C with aeration until the cells reach stationary phase. Cosmid DNA is obtained from the cells in accordance with procedures known in the art (see e.g., Rao *et al.*, 1987 in Methods in Enzymology, 153:166).

DNA of the current invention can be sequenced using any known techniques in the art such as the dideoxynucleotide chain-termination method (Sanger, et al., Proc. Natl. Acad. Sci. 74:5463 (1977)) with either radioisotopic or fluorescent labels. Double-stranded, supercoiled DNA was used directly for templates in sequence reactions with sequence-specific oligonucleotide primers. Alternatively, fragments were used to prepare libraries of either random, overlapping sequences in the bacteriophage M13 or nested, overlapping deletions in a plasmid vector. Individual recombinant DNA subclones were then sequenced with vector-specific oligonucleotide primers. Radioactive reaction products were electrophoresed on denaturing polyacrylamide gels and analyzed by autoradiography. Fluorescent- labeled reaction products were electrophoresed and analyzed on Applied Biosystems (ABI Division, Perkin Elmer, Foster City, CA 94404) model 370A and 373A or DuPont (Wilmington, DE) Genesis DNA sequencers. Sequence data was assembled and edited using Genetic Center Group (GCG, Madison, WI) programs GelAssemble and Seqed or the ABI model 670 Inherit Sequence Analysis system and the AutoAssembler and SeqEd programs.

Polypeptides corresponding to a domain, a synthase unit, or a multi-functional polypeptide can be produced by expression of the cDNA sequence in a bacteria, for example, using known expression vectors. Alternatively, the polypeptides mentioned above can be extracted from tylactone-producing bacteria such as *Streptomyces fradiae*. In addition, the techniques of synthetic chemistry can be employed to synthesize the polypeptides mentioned above. The procedures and techniques for isolation and purification of homogenous protein or polypeptides are well known in the art.

Since the genetic organization of the tylactone synthase gene cluster appears to correspond to the order of the reactions required to complete synthesis of tylactone, knowledge of the tylactone synthase DNA sequence, its genetic organization, and the activities associated with particular open reading frames, modules, and submodules of the gene enables production of novel polyketides having a predicted structure that are not otherwise available. Modifications may be made to the DNA sequence that either alter the initial carboxylic acid building block used or the building block added at any of the condensation steps. The tylactone synthase gene may also be modified to alter the actual number of condensation steps done, thereby changing the size of the carbon backbone. Modifications to portions of the DNA sequence that encode the post-condensation processing activities will alter the functional groups appearing at the various condensation sites on the carbon chain backbone.

These modifications can be accomplished by substituting submodules derived from the tylactone synthase gene and having known activities for corresponding submodules from another polyketide synthase gene having different activities. Submodules from tylactone synthase may also be combined with submodules from other polyketide synthase genes to effect additional catalytic steps. Accordingly, a DNA molecule wherein at least one submodule from the tylactone synthase gene has been combined with, or substituted for, submodules from the DNA sequence of other polyketide synthase genes is also provided by the present invention. Further, submodules that are a part of the present invention may be selectively inactivated thereby giving rise to predictable novel polyketide structures.

For example, a submodule encoding a KS' activity, an AT activity, and an ACP activity, all derived from the first open reading frame of the tylactone synthase gene (ORF1), were exchanged for the corresponding submodule in the platenolide synthase gene (see Example 2). Platenolide is the polyketide backbone of the antibiotic spiramycin.

The submodule from the tylactone synthase gene encodes a domain that catalyzes the incorporation of a propionate as the initial building block whereas the corresponding submodule of the platenolide synthase gene encodes a domain that catalyzes the incorporation of an acetate building block. When the resulting DNA molecule was placed into a bacterial strain and grown under conditions promoting polyketide synthesis, a hybrid molecule having the structure that would be predicted by incorporation of an additional methyl side-chain at the start of the growing polyketide chain was synthesized, in particular, 16-methyl platenolide.

One skilled in the art is fully familiar with the degeneracy of the genetic code. Consequently, the skilled artisan can modify the specific DNA sequences provided by this disclosure to provide proteins having the same or improved characteristics compared to those polypeptides specifically provided herein. Also, one skilled in the art can modify the DNA sequences to express an identical protein to those provided, albeit expressed at higher levels. Furthermore, one skilled in the art is familiar with means to prepare synthetically, either partially, or in whole, DNA sequences which would be useful in preparing recombinant DNA vectors or coding sequences which are encompassed by the current invention. Additionally, recombinant means for modifying the DNA sequences provided may include for example site-directed deletion or site-directed mutagenesis. These techniques are well known to those skilled in the art and require no further elaboration here. Consequently, as used herein, DNA which is isolated from natural sources, prepared synthetically or semi-synthetically, or which are modified by recombinant DNA methods, are within the scope of the present invention.

Likewise, those skilled in the art will recognize that the polypeptides of the invention may be expressed recombinantly. Alternatively, these polypeptides may be synthesized as well, either in whole or in part, by conventional known non-recombinant techniques; for example, solid-phase synthesis. Thus, the present invention should not be construed as necessarily limited to any specific vector constructions or means for production of the specific polyketide synthase molecules exemplified. These alternate means for preparing the present polypeptides are meant to be encompassed by the present invention.

Many cyclized polyketides undergo glycosylation at one or more sites. Tylosin is a 16-membered cyclic lactone, tylactone, with three attached sugar residues. The process of converting tylactone to tylosin is will known in the art. The present invention also provides the information needed to synthesize novel tylosin-related polyketides based on tylactone. The principles have already been described above. In addition, any product resulting from post-transcriptional or post-translational modification *in vivo* or *in vitro* based on the DNA sequence information disclosed herein are meant to be encompassed by the present invention.

The following examples are provided for exemplification purposes only and are not intended to limit the scope of the invention which has been described in broad terms above.

EXAMPLE 1

The DNA sequence of the *Streptomyces fradiae* tylactone synthase gene, *tylG*, was obtained by sequencing the inserts of recombinant DNA subclones containing contiguous or overlapping DNA segments, which when considered cumulatively span the entire region of *tylG*. All sequences representing *tylG* are fully contained in the overlapping cosmid subclones pSET506 and pSET507.

In accord with the current invention, the sequence may now be obtained by subcloning and sequencing the DNA fragment designated by *Eco*RI restriction sites at 3.0 and 4.0 kb on the map presented in Figure 3, the fragment bounded

by the *Eco*RI site at 4.0 kb and the *Bam*HI site at 7.5 kb, the fragments bounded by *Bam*HI sites at 7.5, 12.0, 23.4, 27.3, 34.6, 39.5, and 50.5 kb.

In order to obtain the *tylG* gene on a single DNA fragment, the 31.6 kb DNA fragment bounded by the *Eco*RI site at 3.0 kb and the *Bam*HI site at 34.6 kb is isolated from a partial digestion of pSET506 with the restriction enzymes *Eco*RI and *Bam*HI. The 15.9 kb DNA fragment bounded by the *Bam*HI sites at 34.6 and 50.5 kb is isolated from a partial digestion of pSET507 with the restriction enzyme *Bam*HI. The resulting fragments are ligated and cloned in an appropriate recombinant DNA vector. Clones containing the correct orientation of the two ligated fragments are identified by restriction enzyme site mapping.

EXAMPLE 2

Production of a polyketide hybrid of platenolide and tylactone

The lactone rings of the polyketides platenolide and tylactone undergo an identical set of post-condensation processing steps. However, these two polyketides are synthesized by condensation of more than one type of carboxylic acid and the specific building blocks chosen for incorporation in the two pathways differ. The organization of the platenolide gene cluster is shown in Figure 4 along with the accompanying synthetic pathway in Figure 5. The specific carboxylic acid substrates that are used for each condensation reaction and the post-condensation activities of platenolide synthesis are indicated.

The DNA sequence of the *Streptomyces ambofaciens* platenolide synthase *(srmG)* genes was obtained by sequencing inserts of recombinant DNA subclones containing contiguous or overlapping DNA segments, which when considered together span the entire *srmG* region. All sequences representing *srmG* are fully contained in the overlapping cosmid clones pKC1080 and pKC1306 (Figure 6). The sequence can be obtained by subcloning and sequencing the fragments bounded by *Nru*I sites at position 1, 0.3 kb, 8.2 kb, 14.1 kb, 20.2 kb, 29.5 kb, 31.4 kb, 41.1 kb, and 42.0 kb.

In order to obtain the *srmG* region on a single fragment, the 25.0 kb fragment bounded by the *Nru*I site at position 1 and the *Sfu*I site at 25.0 kb is isolated from a partial digestion of pKC1080 with restriction enzymes *Nru*I and *Sfu*I. The 17.8 kb DNA fragment bounded by the *Sfu*I sites at 25.0 kb and 42.8 kb is isolated by digestion of pKC1306 with the restriction enzyme *Sfu*I. The resulting fragments are ligated and cloned in an appropriate recombinant DNA vector. Clones containing the correct orientation of the two ligated fragments are identified by restriction enzyme mapping.

An exchange of tylactone polyketide synthase DNA with corresponding platenolide DNA was effected as follows in order to generate a novel polyketide structure.

A strain of *Streptomyces ambofaciens*, the organism that produces platenolide, was constructed with most of ORF1 deleted. This ORF1-deficient strain produced no detectable platenolide. To confirm that the lack of ORF1 was the only deficiency in platenolide production, a construct containing ORF1, and not any functional activities of ORFs 2-5, was introduced into the ORF1-deficient strain on a vector that contains the site-specific integration function from the streptomycete phage ϕC31. Integration of ORF1 at the ϕC31 *att* site restored spiramycin production to parental levels, confirming that ORF1 codes for a functional protein and that ORFs 2-5 are expressed in the ORF1-deficient strain.

ORF1 of *tylG* is organized like *srmG* ORF1. DNA coding for a KS', an AT, and an ACP from *tyl* ORF1 was exchanged with the corresponding region from srm ORF1 by replacing an *Eco*RI-*Apa*I fragment of *srm* ORF1 with an *Eco*RI-*Sfu*I fragment from *tyl* ORF1, generating plasmid pKC1524. When pKC1524 was introduced into the ORF1-deficient strain, polyketide synthesis was restored. The products produced by this restored strain were indistinguishable from those produced by the parental strain of *Streptomyces ambofaciens* when analyzed by thin-layer chromatography and HPLC.

The hybrid ORF1 DNA sequence is SEQ ID NO:7 and the amino acid sequence of the ORF1-encoded polypeptide is SEQ ID NO:8. The rest of the DNA sequence of the hybrid molecule is identical to original *tylG* sequence and the polypeptides encoded by this remaining portion are therefore identical as well.

In order to simplify physical analysis of the putative novel polyketide, an *Xho*I fragment encoding sugar synthesis or addition was deleted from the restored. Deletion of this fragment led to a strain that produced only the lactone without any sugar residues added. When analyzed by NMR and mass spectroscopy, the isolated product made by this sugar-deficient strain was confirmed as 16-methylplatenolide, which is the structure that would be predicted from the incorporation of a propionate in place of the acetate normally utilized in platenolide synthesis.

SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT: ELI LILLY AND COMPANY
(B) STREET: Lilly Corporate Center
(C) CITY: Indianapolis
(D) STATE: Indiana
(E) COUNTRY: United States of America
(F) ZIP: 46285

(ii) TITLE OF INVENTION: POLYKETIDE SYNTHASE GENES

(iii) NUMBER OF SEQUENCES: 15

(iv) CORRESPONDENCE ADDRESS:
(A) ADDRESSEE: K. G. TAPPING
(B) STREET: Erl Wood Manor
(C) CITY: Windlesham
(D) STATE: Surrey
(E) COUNTRY: United Kingdom
(F) ZIP: GU20 6PH

(v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: Macintosh
(C) OPERATING SYSTEM: Macintosh 7.0
(D) SOFTWARE: Microsoft Word 5.1

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43280 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 816..14234

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 14351..19945

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 20010..31199

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 31232..36067

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 36249..41774

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

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GGGAAGGAAT CCTGGTGCGG GAAGGCAACG ACTGCGGGAC GCGGGAGAAA GGGGAATCGG     180

CGGGAATTTC CCCCGCGCGG CGGGGACGGT GCCGGAGAAC AACGGCGGGG AAACAGCCCG     240

CGGTCCGTGA CGACAACGGA AACTATGGTC CGCTTCCTCC GTCCACAAGG CGGAACCTGA     300

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CCGTTCGGCG ACCGCGCTGG CGCGCCGCCG TGGACCGGGC CGTAACTCCC CTGCGCCATC     540

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CATACCGGAG AACGAACCCG AACGGCACGG CGGAAAGCCC GTCCGCAATG CCCGGGACAT     660

TCCTGTGACC CGACAACACG GTTTGCCGAC ACGGTTCGCC GCAACGCTTG TTGGCAGGCT     720

CACCGGCACG GCCCGCTGAC ACAGCTCGGT GACACGGCAG CCTGACGGGA AACCGCCGAA     780

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                                        Met Ser Ser Ala Leu Arg
                                        1               5

CGC GCG GTG CAA TCC AAC TGT GGC TAC GGA GAC CTC ATG ACC TCG AAC         881
Arg Ala Val Gln Ser Asn Cys Gly Tyr Gly Asp Leu Met Thr Ser Asn
            10                  15                  20

ACC GCT GCA CAG AAC ACC GGC GAC CAG GAA GAC GTC GAC GGT CCC GAC         929
Thr Ala Ala Gln Asn Thr Gly Asp Gln Glu Asp Val Asp Gly Pro Asp
        25                  30                  35

AGC ACA CAC GGT GGG GAG ATC GCC GTC GTG GGA ATG TCG TGC CGT CTG         977
Ser Thr His Gly Gly Glu Ile Ala Val Val Gly Met Ser Cys Arg Leu
    40                  45                  50

CCG GGC GCG GCC GGT GTC GAG GAA TTC TGG GAA CTG CTG CGC AGC GGA        1025
Pro Gly Ala Ala Gly Val Glu Glu Phe Trp Glu Leu Leu Arg Ser Gly
55                  60                  65                  70
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Arg Gly Met Pro Thr Arg Gln Asp Asp Gly Thr Trp Arg Ala Ala Leu
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GAG GAC CAC GCC GGC TTC GAC GCC GGG TTC TTC GGC ATG AAC GCC CGG      1121
Glu Asp His Ala Gly Phe Asp Ala Gly Phe Phe Gly Met Asn Ala Arg
            90                  95                  100

CAG GCC GCC GCC ACC GAC CCG CAG CAC CGA CTG ATG CTG GAA CTC GGA      1169
Gln Ala Ala Ala Thr Asp Pro Gln His Arg Leu Met Leu Glu Leu Gly
        105                 110                 115

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Trp Glu Ala Leu Glu Asp Ala Gly Ile Val Pro Gly Asp Leu Thr Gly
    120                 125                 130

ACC GAC ACC GGA GTC TTC GCC GGC GTG GCG TCC GAC GAC TAT GCC GTT      1265
Thr Asp Thr Gly Val Phe Ala Gly Val Ala Ser Asp Asp Tyr Ala Val
135                 140                 145                 150

CTC ACC CGC CGT TCC GCC GTC TCC GCC GGG GGA TAC ACC GCC ACG GGG      1313
Leu Thr Arg Arg Ser Ala Val Ser Ala Gly Gly Tyr Thr Ala Thr Gly
                155                 160                 165

CTG CAC CGC GCC CTG GCC GCC AAC CGC CTC TCC CAC TTC CTG GGC CTG      1361
Leu His Arg Ala Leu Ala Ala Asn Arg Leu Ser His Phe Leu Gly Leu
            170                 175                 180

CGC GGC CCC AGC CTG GTC GTC GAC TCG GCC CAG TCC GCC TCA CTG GTG      1409
Arg Gly Pro Ser Leu Val Val Asp Ser Ala Gln Ser Ala Ser Leu Val
        185                 190                 195

GCC GTC CAG CTC GCC TGC GAG AGT CTG CGC CGG GGT GAG ACG TCG CTC      1457
Ala Val Gln Leu Ala Cys Glu Ser Leu Arg Arg Gly Glu Thr Ser Leu
    200                 205                 210

GCC GTC GCG GGC GGT GTC AAC CTC ATC CTC ACC GAG GAG AGC ACC ACC      1505
Ala Val Ala Gly Gly Val Asn Leu Ile Leu Thr Glu Glu Ser Thr Thr
215                 220                 225                 230

GTC ATG GAG CGT ATG GGA GCG CTC TCA CCC GAC GGC CGC TGC CAC ACC      1553
Val Met Glu Arg Met Gly Ala Leu Ser Pro Asp Gly Arg Cys His Thr
                235                 240                 245

TTC GAC GCC CGC GCC AAC GGC TAC GTA CGC GGC GAG GGC GGC GGA GCC      1601
Phe Asp Ala Arg Ala Asn Gly Tyr Val Arg Gly Glu Gly Gly Gly Ala
            250                 255                 260

GTC GTG CTC AAG CCA CTG GAC GCC GCA CTC GCC GAC GGC GAC CGC GTG      1649
Val Val Leu Lys Pro Leu Asp Ala Ala Leu Ala Asp Gly Asp Arg Val
        265                 270                 275

TAC TGC GTC ATC AAG GGA GGT GCC GTC AAC AAC GAC GGC GGC GGC GCG      1697
Tyr Cys Val Ile Lys Gly Gly Ala Val Asn Asn Asp Gly Gly Gly Ala
    280                 285                 290

AGC CTC ACC ACT CCC GAC CGG GAG GCG CAG GAA GCT GTG CTG CGC CAG      1745
Ser Leu Thr Thr Pro Asp Arg Glu Ala Gln Glu Ala Val Leu Arg Gln
295                 300                 305                 310
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GCC TAC CGG CGG GCG GGC GTC AGC ACC GGC GCC GTC CGC TAC GTC GAG      1793
Ala Tyr Arg Arg Ala Gly Val Ser Thr Gly Ala Val Arg Tyr Val Glu
                315                 320                 325

CTG CAC GGG ACC GGC ACC CGG GCC GGC GAC CCC GTC GAG GCG GCC GCA      1841
Leu His Gly Thr Gly Thr Arg Ala Gly Asp Pro Val Glu Ala Ala Ala
            330                 335                 340

CTG GGC GCC GTG CTC GGG GCG GGG GCG GAC AGC GGC CGC AGC ACG CCG      1889
Leu Gly Ala Val Leu Gly Ala Gly Ala Asp Ser Gly Arg Ser Thr Pro
        345                 350                 355

CTC GCC GTC GGC TCG GTG AAG ACC AAC GTC GGC CAT CTG GAG GGC GCG      1937
Leu Ala Val Gly Ser Val Lys Thr Asn Val Gly His Leu Glu Gly Ala
    360                 365                 370

GCG GGC ATC GTC GGA CTG ATC AAG GCC ACG CTG TGC GTA CGG AAG GGC      1985
Ala Gly Ile Val Gly Leu Ile Lys Ala Thr Leu Cys Val Arg Lys Gly
375                 380                 385                 390

GAA CTC GTC CCC AGC CTC AAC TTC AGC ACG CCG AAC CCT GAC ATC CCC      2033
Glu Leu Val Pro Ser Leu Asn Phe Ser Thr Pro Asn Pro Asp Ile Pro
                395                 400                 405

CTC GAC GAC CTG CGG CTG CGC GTC CAG ACC GAA CGG CAG GAG TGG AAC      2081
Leu Asp Asp Leu Arg Leu Arg Val Gln Thr Glu Arg Gln Glu Trp Asn
            410                 415                 420

GAG GAG GAC GAC CGG CCG CGC GTG GCC GGC GTC TCC TCC TTC GGT ATG      2129
Glu Glu Asp Asp Arg Pro Arg Val Ala Gly Val Ser Ser Phe Gly Met
        425                 430                 435

GGC GGA ACC AAT GTC CAC CTC GTG ATC GCG GAG GCT CCG GCC GCG GCG      2177
Gly Gly Thr Asn Val His Leu Val Ile Ala Glu Ala Pro Ala Ala Ala
    440                 445                 450

GGG TCC TCC GGG GCG GGG GGT TCG GGC GCT GGT TCC GGT GCC GGT ATC      2225
Gly Ser Ser Gly Ala Gly Gly Ser Gly Ala Gly Ser Gly Ala Gly Ile
455                 460                 465                 470

AGC GCT GTT TCT GGT GTG GTG CCG GTG GTG GTT TCG GGG CGT TCG CGG      2273
Ser Ala Val Ser Gly Val Val Pro Val Val Val Ser Gly Arg Ser Arg
                475                 480                 485

GTG GTG GTG CGG GAG GCT GCG GGC CGG TTG GCG GAG GTG GTG GAG GCC      2321
Val Val Val Arg Glu Ala Ala Gly Arg Leu Ala Glu Val Val Glu Ala
            490                 495                 500

GGT GGT GTG GGG CTG GCG GAT GTG GCG GTG ACG ATG GCG GAC CGG TCG      2369
Gly Gly Val Gly Leu Ala Asp Val Ala Val Thr Met Ala Asp Arg Ser
        505                 510                 515

CGG TTT GGG TAT CGG GCG GTT GTG CTG GCT CGG GGT GAG GCT GAG CTT      2417
Arg Phe Gly Tyr Arg Ala Val Val Leu Ala Arg Gly Glu Ala Glu Leu
    520                 525                 530

GCC GGG CGT TTG CGG GCG TTG GCG GGG GGT GAT CCG GAC GCG GGT GTG      2465
Ala Gly Arg Leu Arg Ala Leu Ala Gly Gly Asp Pro Asp Ala Gly Val
535                 540                 545                 550
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GTC ACC GGT GCG GTT CTC GAC GGT GGT GTG GTT GTC GGT GCT GCC CCC      2513
Val Thr Gly Ala Val Leu Asp Gly Gly Val Val Val Gly Ala Ala Pro
                555                 560                 565

GGC GGT GCC GGT GCT GCC GGT GGT GCC GGT GCT GCC GGT GGT GCC GGT      2561
Gly Gly Ala Gly Ala Ala Gly Gly Ala Gly Ala Ala Gly Gly Ala Gly
            570                 575                 580

GGT GGG GGC GTG GTG TTG GTT TTC CCT GGT CAG GGG ACG CAG TGG GTG      2609
Gly Gly Gly Val Val Leu Val Phe Pro Gly Gln Gly Thr Gln Trp Val
        585                 590                 595

GGG ATG GGT GCG GGG CTG CTG GGG TCT TCG GAG GTG TTT GCG GCG TCG      2657
Gly Met Gly Ala Gly Leu Leu Gly Ser Ser Glu Val Phe Ala Ala Ser
    600                 605                 610

ATG CGG GAG TGT GCG CGG GCG CTG AGT GTT CAT GTG GGG TGG GAT TTG      2705
Met Arg Glu Cys Ala Arg Ala Leu Ser Val His Val Gly Trp Asp Leu
615                 620                 625                 630

CTG GAG GTG GTG TCG GGC GGG GCC GGG TTG GAG CGG GTG GAT GTG GTG      2753
Leu Glu Val Val Ser Gly Gly Ala Gly Leu Glu Arg Val Asp Val Val
                635                 640                 645

CAG CCG GTG ACG TGG GCG GTG ATG GTG TCG CTG GCC CGG TAC TGG CAG      2801
Gln Pro Val Thr Trp Ala Val Met Val Ser Leu Ala Arg Tyr Trp Gln
            650                 655                 660

GCG ATG GGT GTG GAC GTG GCT GCG GTG GTG GGT CAT TCC CAG GGG GAG      2849
Ala Met Gly Val Asp Val Ala Ala Val Val Gly His Ser Gln Gly Glu
        665                 670                 675

ATC GCC GCT GCC ACG GTG GCG GGG GCG TTG TCG CTG GAG GAT GCG GCG      2897
Ile Ala Ala Ala Thr Val Ala Gly Ala Leu Ser Leu Glu Asp Ala Ala
    680                 685                 690

GCT GTG GTC GCT CTG CGG GCG GGG TTG ATT GGC CGG TAT CTG GCG GGT      2945
Ala Val Val Ala Leu Arg Ala Gly Leu Ile Gly Arg Tyr Leu Ala Gly
695                 700                 705                 710

CGT GGT GCG ATG GCG GCT GTT CCG CTG CCT GCC GGC GAG GTC GAG GCC      2993
Arg Gly Ala Met Ala Ala Val Pro Leu Pro Ala Gly Glu Val Glu Ala
                715                 720                 725

GGG CTG GCG AAG TGG CCG GGT GTG GAG GTC GCG GCG GTC AAC GGT CCG      3041
Gly Leu Ala Lys Trp Pro Gly Val Glu Val Ala Ala Val Asn Gly Pro
            730                 735                 740

GCG TCT ACG GTG GTT TCC GGG GAT CGG CGG GCG GTG GCC GGT TAT GTG      3089
Ala Ser Thr Val Val Ser Gly Asp Arg Arg Ala Val Ala Gly Tyr Val
        745                 750                 755

GCC GTC TGT CAG GCG GAG GGT GTG CAG GCC CGG TTG ATA CCG GTG GAC      3137
Ala Val Cys Gln Ala Glu Gly Val Gln Ala Arg Leu Ile Pro Val Asp
    760                 765                 770

TAC GCC TCT CAC TCC CGC CAT GTG GAG GAC CTG AAG GGC GAG TTG GAG      3185
Tyr Ala Ser His Ser Arg His Val Glu Asp Leu Lys Gly Glu Leu Glu
775                 780                 785                 790
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CGG GTG CTG TCC GGT ATC CGC CCC CGC AGT CCG CGG GTG CCG GTG TGT      3233
Arg Val Leu Ser Gly Ile Arg Pro Arg Ser Pro Arg Val Pro Val Cys
            795                 800                 805

TCC ACC GTC GCC GGA GAG CAG CCG GGC GAG CCG GTT TTC GAT GCG GGG      3281
Ser Thr Val Ala Gly Glu Gln Pro Gly Glu Pro Val Phe Asp Ala Gly
        810                 815                 820

TAT TGG TTC CGT AAT CTG CGG AAC CGG GTT GAG TTC TCC GCG GTG GTC      3329
Tyr Trp Phe Arg Asn Leu Arg Asn Arg Val Glu Phe Ser Ala Val Val
    825                 830                 835

GGT GGT TTG TTG GAG GAG GGC CAC CGT CGG TTC ATC GAG GTC AGT GCC      3377
Gly Gly Leu Leu Glu Glu Gly His Arg Arg Phe Ile Glu Val Ser Ala
840                 845                 850

CAC CCG GTA CTC GTC CAT GCG ATC GAG CAG ACG GCC GAG GCC GCG GAC      3425
His Pro Val Leu Val His Ala Ile Glu Gln Thr Ala Glu Ala Ala Asp
855                 860                 865                 870

CGG AGT GTC CAT GCC ACC GGG ACC CTG CGC CGC CAG GAC GAC AGC CCG      3473
Arg Ser Val His Ala Thr Gly Thr Leu Arg Arg Gln Asp Asp Ser Pro
            875                 880                 885

CAC CGC CTG CTG ACC TCC ACC GCC GAG GCC TGG GCC CAC GGC GCC ACC      3521
His Arg Leu Leu Thr Ser Thr Ala Glu Ala Trp Ala His Gly Ala Thr
        890                 895                 900

CTC ACC TGG GAC CCC GCC CTG CCC CCA GGC CAC CTC ACC ACC CTC CCC      3569
Leu Thr Trp Asp Pro Ala Leu Pro Pro Gly His Leu Thr Thr Leu Pro
    905                 910                 915

ACC TAC CCC TTC AAC CAC CAC CAC TAC TGG CTC GAC ACC ATT GAC GGG      3617
Thr Tyr Pro Phe Asn His His His Tyr Trp Leu Asp Thr Ile Asp Gly
920                 925                 930

GGC GGA GGG GAC GAC GCG ACC CAG GAG AAG GAG AGC GGC CCT CTG ACG      3665
Gly Gly Gly Asp Asp Ala Thr Gln Glu Lys Glu Ser Gly Pro Leu Thr
935                 940                 945                 950

CGG GAA CTG CGT GGG CTG CCG TCC TCT CAG AAG CAA CTG GGT TTC CTG      3713
Arg Glu Leu Arg Gly Leu Pro Ser Ser Gln Lys Gln Leu Gly Phe Leu
            955                 960                 965

CTC GAT CTG GTG TGC CGG CAC ACG GCC GTC GTA CTC GGC CTG GAC ACG      3761
Leu Asp Leu Val Cys Arg His Thr Ala Val Val Leu Gly Leu Asp Thr
        970                 975                 980

GCC GCC GAG GTG GAC CCG GAC CTG TCC TTC AAG AAG CAG GGC ATC CAG      3809
Ala Ala Glu Val Asp Pro Asp Leu Ser Phe Lys Lys Gln Gly Ile Gln
    985                 990                 995

TCC ATG ACC GGC GTC GAG CTG CGC AAC AGG CTG CTG ACC GAG ACC GGC      3857
Ser Met Thr Gly Val Glu Leu Arg Asn Arg Leu Leu Thr Glu Thr Gly
1000                1005                1010

CTG GCA TTG CCC ACC ACC CTC GTC TAC GAC CGG CCC ACC CCT CGC GCC      3905
Leu Ala Leu Pro Thr Thr Leu Val Tyr Asp Arg Pro Thr Pro Arg Ala
1015                1020                1025                1030
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CTG GCG CAG TTC CTC CAC ACC GAG TTG CTC GAC GGC TCC CCC TCG GGC      3953
Leu Ala Gln Phe Leu His Thr Glu Leu Leu Asp Gly Ser Pro Ser Gly
                1035                1040                1045

TCC GTC CTC GCA CCG GCG CAG AAG AGC TTC GAA GCC CAG GAG CCG ATC      4001
Ser Val Leu Ala Pro Ala Gln Lys Ser Phe Glu Ala Gln Glu Pro Ile
            1050                1055                1060

GCG GTG GTG GGT ATG GGG TGC CGG TTC CCC GGT GGG GTG GGT TCG CCG      4049
Ala Val Val Gly Met Gly Cys Arg Phe Pro Gly Gly Val Gly Ser Pro
        1065                1070                1075

GAG GCG TTG TGG CGG TTG GTG GTG GAG GGG GTG GAC GCG GTT TCC CCG      4097
Glu Ala Leu Trp Arg Leu Val Val Glu Gly Val Asp Ala Val Ser Pro
    1080                1085                1090

TTT CCC GGT GAT CGT GGC TGG GAT GTG GAG GGG TTG TAC GAC CCG GAG      4145
Phe Pro Gly Asp Arg Gly Trp Asp Val Glu Gly Leu Tyr Asp Pro Glu
1095                1100                1105                1110

CCG GGT GTG GCG GGG AAG TCG TAT GTG CGG GAG GGG GGT TTT CTG CAT      4193
Pro Gly Val Ala Gly Lys Ser Tyr Val Arg Glu Gly Gly Phe Leu His
                1115                1120                1125

GAT GCG GCG GAG TTC GAT GCG GAG TTC TTC GGG ATT TCG CCG CGT GAG      4241
Asp Ala Ala Glu Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg Glu
            1130                1135                1140

GCG GTG GCG ATG GAT CCG CAG CAG CGG CTG TTG CTG GAG ACC TCC TGG      4289
Ala Val Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser Trp
        1145                1150                1155

GAG GCG ATC GAG CGG GCG GGT ATC GAC CCG CAC TCG CTG CAC GGC AGC      4337
Glu Ala Ile Glu Arg Ala Gly Ile Asp Pro His Ser Leu His Gly Ser
    1160                1165                1170

CGC ACC GGC GTC TAC GCC GGC GTG ATG CCG CAG GAA TAC GGA CCT CGG      4385
Arg Thr Gly Val Tyr Ala Gly Val Met Pro Gln Glu Tyr Gly Pro Arg
1175                1180                1185                1190

CTC GCC GAA GGA GCG GAA GGC AGC GAC GGC TAC CTC CTC ACC GGT ACG      4433
Leu Ala Glu Gly Ala Glu Gly Ser Asp Gly Tyr Leu Leu Thr Gly Thr
                1195                1200                1205

TCG GGG AGT GTG GTG TCG GGG CGT GTG GCC TAC ACG CTG GGG CTG GAG      4481
Ser Gly Ser Val Val Ser Gly Arg Val Ala Tyr Thr Leu Gly Leu Glu
            1210                1215                1220

GGT CCG GCC GTG ACC GTG GAT ACG GCG TGT TCG TCG TCG TTG GTG GCG      4529
Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala
        1225                1230                1235

TTG CAT CTG GCG GTG CAG GCG TTG CGG GGT GGC GAG TGT GAC ATG GCG      4577
Leu His Leu Ala Val Gln Ala Leu Arg Gly Gly Glu Cys Asp Met Ala
    1240                1245                1250

TTG GCC GGT GGT GTG ACG GTG ATG GCC GGG CCG GGG ATG TTC GTG GAG      4625
Leu Ala Gly Gly Val Thr Val Met Ala Gly Pro Gly Met Phe Val Glu
1255                1260                1265                1270
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TTT TCG CGG CAG CGG GGG TTG GCG GCC GAT GGG CGG TGC AAG GCG TTC      4673
Phe Ser Arg Gln Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys Ala Phe
                1275                1280                1285

GCG GAT GGG GCG GAT GGG ACC GCT TGG GCC GAG GGT GCG GGG GTG GTG      4721
Ala Asp Gly Ala Asp Gly Thr Ala Trp Ala Glu Gly Ala Gly Val Val
            1290                1295                1300

CTG GTG GAG CGG TTG TCG GAT GCC CGG CGG TTG GGG CAT CCG GTG TTG      4769
Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Leu Gly His Pro Val Leu
        1305                1310                1315

GCG GTG GTG TGT GGG TCG GCG GTG AAT CAG GAC GGT GCG TCG AAT GGT      4817
Ala Val Val Cys Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly
    1320                1325                1330

TTG ACG GCG CCG AGT GGT CCG TCG CAG GAG CGG GTG ATT CGT CAG GCG      4865
Leu Thr Ala Pro Ser Gly Pro Ser Gln Glu Arg Val Ile Arg Gln Ala
1335                1340                1345                1350

TTG GGG AAT GCG CGG TTG ACG GTG GCG GAT GTG GAT GTG GTG GAG GCG      4913
Leu Gly Asn Ala Arg Leu Thr Val Ala Asp Val Asp Val Val Glu Ala
            1355                1360                1365

CAT GGG ACG GGG ACG CGG CTG GGT GAT CCG ATC GAG GCG CAG GCG TTG      4961
His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu
            1370                1375                1380

CTG GGG ACG TAT GGG CGG GAT CGT GAT GGT GGG CGT CCG GTG TGG TTG      5009
Leu Gly Thr Tyr Gly Arg Asp Arg Asp Gly Gly Arg Pro Val Trp Leu
        1385                1390                1395

GGG TCG TTG AAG TCG AAT ATT GGT CAT GCT CAG GCG GCT GCG GGG GTG      5057
Gly Ser Leu Lys Ser Asn Ile Gly His Ala Gln Ala Ala Ala Gly Val
    1400                1405                1410

GCT GGT GTG ATC AAG ATG GTG TTG GCG ATG CGG TAT GGG TGG TTG CCG      5105
Ala Gly Val Ile Lys Met Val Leu Ala Met Arg Tyr Gly Trp Leu Pro
1415                1420                1425                1430

CGG ACG TTG CAT GTG GAT GAG CCG AGC CGG CAT GTG GAC TGG TCG GCT      5153
Arg Thr Leu His Val Asp Glu Pro Ser Arg His Val Asp Trp Ser Ala
                1435                1440                1445

GGT GGT GTG TGG TTG CTG ACC GAG GCG CGG GAG TGG CCG GGG GTG GAC      5201
Gly Gly Val Trp Leu Leu Thr Glu Ala Arg Glu Trp Pro Gly Val Asp
            1450                1455                1460

CGG CCG CGT CGG GCG GCG GTC TCC GCC TTT GGT GTC AGT GGT ACC AAC      5249
Arg Pro Arg Arg Ala Ala Val Ser Ala Phe Gly Val Ser Gly Thr Asn
        1465                1470                1475

GCC CAT CTG ATC CTC GAA GCC CCC GAC ACC GCC GAG GCG GAG AGC GCC      5297
Ala His Leu Ile Leu Glu Ala Pro Asp Thr Ala Glu Ala Glu Ser Ala
    1480                1485                1490

ACG ACC CCG GTC CGC TCT GAG GTG TCG GAG TCT GCT GCG GTC CTC GAT      5345
Thr Thr Pro Val Arg Ser Glu Val Ser Glu Ser Ala Ala Val Leu Asp
1495                1500                1505                1510
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GCC CGC AGT GGT GTG GTG CCG GTG GTG GTT TCG GGG CGT TCG CGG GTG      5393
Ala Arg Ser Gly Val Val Pro Val Val Val Ser Gly Arg Ser Arg Val
                1515                1520                1525

GTG GTG CGG GAG GCT GCG GGC CGG TTG GCG GAG GTG GTG GAG GCC GGT      5441
Val Val Arg Glu Ala Ala Gly Arg Leu Ala Glu Val Val Glu Ala Gly
            1530                1535                1540

GGT GTG GGG CTG GCG GAT GTG GCG GTG ACG ATG GCG GGC CGG TCG CGG      5489
Gly Val Gly Leu Ala Asp Val Ala Val Thr Met Ala Gly Arg Ser Arg
        1545                1550                1555

TTT GGG TAT CGG GCG GTT GTG CTG GCT CGG GGT GAG GCT GAG CTT GCC      5537
Phe Gly Tyr Arg Ala Val Val Leu Ala Arg Gly Glu Ala Glu Leu Ala
    1560                1565                1570

GGG CGT TTG CGG GCG TTG GCG GGG GGT GAT CCG GAC GCG GGT GTG GTC      5585
Gly Arg Leu Arg Ala Leu Ala Gly Gly Asp Pro Asp Ala Gly Val Val
1575                1580                1585                1590

ACC GGT GCG GTG GTG GAC CCG GAG ACG GGG TCC GGT GGT GGG GGC GTG      5633
Thr Gly Ala Val Val Asp Pro Glu Thr Gly Ser Gly Gly Gly Gly Val
                1595                1600                1605

GTG TTG GTT TTC CCT GGT CAG GGG ACG CAG TGG GTG GGG ATG GGT GCG      5681
Val Leu Val Phe Pro Gly Gln Gly Thr Gln Trp Val Gly Met Gly Ala
            1610                1615                1620

GGG CTG CTG GGG TCT TCG GAG GTG TTT GCG GCG TCG ATG CGG GAG TGT      5729
Gly Leu Leu Gly Ser Ser Glu Val Phe Ala Ala Ser Met Arg Glu Cys
        1625                1630                1635

GCG CGG GCG CTG AGT GTT CAT GTG GAG TGG GAT TTG CTG GAG GTG GTG      5777
Ala Arg Ala Leu Ser Val His Val Glu Trp Asp Leu Leu Glu Val Val
    1640                1645                1650

TCG GGC GGG GCC GGG TTG GAG CGG GTG GAT GTG GTG CAG CCC GTG ACG      5825
Ser Gly Gly Ala Gly Leu Glu Arg Val Asp Val Val Gln Pro Val Thr
1655                1660                1665                1670

TGG GCG GTG ATG GTG TCG CTG GCC CGG TAC TGG CAG GCG ATG GGT GTG      5873
Trp Ala Val Met Val Ser Leu Ala Arg Tyr Trp Gln Ala Met Gly Val
                1675                1680                1685

GAC GTG GCT GCG GTG GTG GGT CAT TCC CAG GGG GAG ATC GCT GCT GCC      5921
Asp Val Ala Ala Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Ala
            1690                1695                1700

ACG GTG GCG GGG GCG TTG TCG CTG GAG GAT GCG GCG GCT GTG GTC GCT      5969
Thr Val Ala Gly Ala Leu Ser Leu Glu Asp Ala Ala Ala Val Val Ala
        1705                1710                1715

CTG CGG GCG GGG TTG ATT GGC CGG TAT CTG GCG GGT CGT GGT GCG ATG      6017
Leu Arg Ala Gly Leu Ile Gly Arg Tyr Leu Ala Gly Arg Gly Ala Met
    1720                1725                1730

GCG GCT GTT CCG CTG CCT GCC GGC GAG GTC GAG GCC GGG CTG GCG AAG      6065
Ala Ala Val Pro Leu Pro Ala Gly Glu Val Glu Ala Gly Leu Ala Lys
1735                1740                1745                1750
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TGG CCG GGT GTG GAG GTC GCG GCG GTC AAC GGT CCG GCG TCC ACG GTG      6113
Trp Pro Gly Val Glu Val Ala Ala Val Asn Gly Pro Ala Ser Thr Val
                1755                1760                1765

GTT TCC GGG GAT CGG CGG GCG GTG GCC GGT TAT GTG GCC GTC TGT CAG      6161
Val Ser Gly Asp Arg Arg Ala Val Ala Gly Tyr Val Ala Val Cys Gln
            1770                1775                1780

GCG GAG GGT GTG CAG GCT CGG TTG ATA CCG GTG GAC TAC GCC TCT CAC      6209
Ala Glu Gly Val Gln Ala Arg Leu Ile Pro Val Asp Tyr Ala Ser His
        1785                1790                1795

TCC CGC CAT GTG GAG GAC CTG AAG GGC GAG TTG GAG CGG GTG CTG TCC      6257
Ser Arg His Val Glu Asp Leu Lys Gly Glu Leu Glu Arg Val Leu Ser
    1800                1805                1810

GGT ATC CGC CCC CGC AGT CCG CGG GTG CCG GTG TGT TCC ACC GTC GCC      6305
Gly Ile Arg Pro Arg Ser Pro Arg Val Pro Val Cys Ser Thr Val Ala
1815                1820                1825                1830

GGA GAG CAG CCG GGC GAG CCG GTT TTC GAT GCG GGG TAT TGG TTC CGT      6353
Gly Glu Gln Pro Gly Glu Pro Val Phe Asp Ala Gly Tyr Trp Phe Arg
                1835                1840                1845

AAT CTG CGG AAC CGG GTT GAG TTC TCC GCG GTG GTC GGT GGT TTG TTG      6401
Asn Leu Arg Asn Arg Val Glu Phe Ser Ala Val Val Gly Gly Leu Leu
            1850                1855                1860

GAG GAG GGC CAC CGT CGG TTC ATC GAG GTC AGT GCC CAC CCG GTA CTC      6449
Glu Glu Gly His Arg Arg Phe Ile Glu Val Ser Ala His Pro Val Leu
        1865                1870                1875

GTC CAT GCG ATC GAG CAG ACG GCC GAG GCC GCG GAC CGG AGT GTC CAT      6497
Val His Ala Ile Glu Gln Thr Ala Glu Ala Ala Asp Arg Ser Val His
    1880                1885                1890

GCC ACC GGG ACC CTG CGC CGC CAG GAC GAC AGC CCG CAC CGC CTG CTG      6545
Ala Thr Gly Thr Leu Arg Arg Gln Asp Asp Ser Pro His Arg Leu Leu
1895                1900                1905                1910

ACC TCC ACC GCC GAG GCC TGG GCC CAC GGC GCC ACC CTC ACC TGG GAC      6593
Thr Ser Thr Ala Glu Ala Trp Ala His Gly Ala Thr Leu Thr Trp Asp
                1915                1920                1925

CCC GCC CTG CCC CCA GGC CAC CTC ACC ACC CTC CCC ACC TAC CCC TTC      6641
Pro Ala Leu Pro Pro Gly His Leu Thr Thr Leu Pro Thr Tyr Pro Phe
            1930                1935                1940

AAC CAC CAC CAC TAC TGG CTC GAC ACC ACC CCC ACC ACC CCC GCG ACG      6689
Asn His His His Tyr Trp Leu Asp Thr Thr Pro Thr Thr Pro Ala Thr
        1945                1950                1955

ACC ACC CAG AGC CCC ACC GAT GCC TGG CGC TAC CGC GTC ACC TGG AAA      6737
Thr Thr Gln Ser Pro Thr Asp Ala Trp Arg Tyr Arg Val Thr Trp Lys
    1960                1965                1970

GCC CTG ACC GAA TCC TCC CCC GTC CGC CCT CAC TCC ATC GGT CGC TGC      6785
Ala Leu Thr Glu Ser Ser Pro Val Arg Pro His Ser Ile Gly Arg Cys
1975                1980                1985                1990
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CTC CTC GTT GCA CCC CCG ACC ACC GAC GGC GAG CTC CTC GAC GGA CTG      6833
Leu Leu Val Ala Pro Pro Thr Thr Asp Gly Glu Leu Leu Asp Gly Leu
                1995                2000                2005

ACA ACG GTG TTG TCC GAG CGC GGT GCC TCC GTC GCC CGC CTT GAG GTG      6881
Thr Thr Val Leu Ser Glu Arg Gly Ala Ser Val Ala Arg Leu Glu Val
            2010                2015                2020

CCC ATC GGC GCG CGG CGT GCC GAG GTC GCC GAA CTG CTC AAG CCC TCC      6929
Pro Ile Gly Ala Arg Arg Ala Glu Val Ala Glu Leu Leu Lys Pro Ser
        2025                2030                2035

ATG GAG TCA GCG GGG GAG GAG AAC ACC ACC GTC GTC TCG CTT CTC GGT      6977
Met Glu Ser Ala Gly Glu Glu Asn Thr Thr Val Val Ser Leu Leu Gly
    2040                2045                2050

CTG GTG CCC TCC ACG GAC GCG GTC AGG ACG TCG ATA GCG CTC CTC CAG      7025
Leu Val Pro Ser Thr Asp Ala Val Arg Thr Ser Ile Ala Leu Leu Gln
2055                2060                2065                2070

GCG GTC TCC GAC ATC GGC GTC CCG GCC GCC AGG GTC TGG GCG CTG ACG      7073
Ala Val Ser Asp Ile Gly Val Pro Ala Ala Arg Val Trp Ala Leu Thr
                2075                2080                2085

CGG AGG GCC GTG GCC GTG GTT CCC GGG GAG ACG CCG CAG GAC GCG GGG      7121
Arg Arg Ala Val Ala Val Val Pro Gly Glu Thr Pro Gln Asp Ala Gly
            2090                2095                2100

GCC CAG TTG TGG GGC TTC GGA CGA GTG GCG GCC CTT GAA CTC CCG GAT      7169
Ala Gln Leu Trp Gly Phe Gly Arg Val Ala Ala Leu Glu Leu Pro Asp
        2105                2110                2115

ATC TGG GGC GGC TTG ATC GAT CTG CCG GAG ACA GCG GAG CTG ACG CGG      7217
Ile Trp Gly Gly Leu Ile Asp Leu Pro Glu Thr Ala Glu Leu Thr Arg
    2120                2125                2130

ACG CCG GAG ACC TCA CAG CCC CCA CAG ACC CCG GAG AGG CTG CCG CAG      7265
Thr Pro Glu Thr Ser Gln Pro Pro Gln Thr Pro Glu Arg Leu Pro Gln
2135                2140                2145                2150

ACT CCG AAC CGA CGC GCC CTT GAG CTT GCT GCC GCC GTC CTC GCC GGC      7313
Thr Pro Asn Arg Arg Ala Leu Glu Leu Ala Ala Ala Val Leu Ala Gly
                2155                2160                2165

CGC GAC GGC GAG GAC CAG GTC GCC GTG CGC GCC TCG GGG ATC TAC GGG      7361
Arg Asp Gly Glu Asp Gln Val Ala Val Arg Ala Ser Gly Ile Tyr Gly
            2170                2175                2180

CGG CGG GTG TCG CGG GCC GCG GCA GCG GGG GCC GCC TCC TGG CAG CCG      7409
Arg Arg Val Ser Arg Ala Ala Ala Ala Gly Ala Ala Ser Trp Gln Pro
        2185                2190                2195

TCC GGC ACG GTG CTG ATC ACC GGC GGC ATG GGT GCC ATC GGC AGG CGG      7457
Ser Gly Thr Val Leu Ile Thr Gly Gly Met Gly Ala Ile Gly Arg Arg
    2200                2205                2210

CTC GCC CGC AGG CTG GCG GCC GAG GGA GCC GAA CGC CTG GTC CTC ACC      7505
Leu Ala Arg Arg Leu Ala Ala Glu Gly Ala Glu Arg Leu Val Leu Thr
2215                2220                2225                2230
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AGC CGT CGC GGA CCG GAG GCG CCG GGC GCC GCC GAA CTC GCC GAG GAA      7553
Ser Arg Arg Gly Pro Glu Ala Pro Gly Ala Ala Glu Leu Ala Glu Glu
                2235                2240                2245

CTG CGA GGA CAT GGC TGC GAG GTC GTG CAC GCG GCC TGT GAC GTG GCC      7601
Leu Arg Gly His Gly Cys Glu Val Val His Ala Ala Cys Asp Val Ala
            2250                2255                2260

GAG CGT GAT GCG CTC GCC GCG CTC GTC ACC GCG TAT CCG CCG AAC GCC      7649
Glu Arg Asp Ala Leu Ala Ala Leu Val Thr Ala Tyr Pro Pro Asn Ala
        2265                2270                2275

GTC TTC CAC ACC GCC GGG ATT CTG GAC GAC GCG GTG ATC GAC ACG CTG      7697
Val Phe His Thr Ala Gly Ile Leu Asp Asp Ala Val Ile Asp Thr Leu
    2280                2285                2290

TCA CCG GAG AGC TTC GAG ACC GTC CGC GGG GCG AAG GTG TGC GGC GCG      7745
Ser Pro Glu Ser Phe Glu Thr Val Arg Gly Ala Lys Val Cys Gly Ala
2295                2300                2305                2310

GAG CTG CTG CAC CAA CTG ACT GCG GAC ATA AAA GGG TTG GAC GCC TTC      7793
Glu Leu Leu His Gln Leu Thr Ala Asp Ile Lys Gly Leu Asp Ala Phe
                2315                2320                2325

GTC CTC TTC TCC TCC GTC ACC GGC ACA TGG GGC AAC GCC GGC CAG GGT      7841
Val Leu Phe Ser Ser Val Thr Gly Thr Trp Gly Asn Ala Gly Gln Gly
            2330                2335                2340

GCG TAC GCC GCC GCC AAC GCC GCG CTC GAC GCC CTC GCC GAG CGT CGC      7889
Ala Tyr Ala Ala Ala Asn Ala Ala Leu Asp Ala Leu Ala Glu Arg Arg
        2345                2350                2355

CGT GCC GCC GGA CTG CCC GCG ACC TCC GTC GCC TGG GGC CTT TGG GGC      7937
Arg Ala Ala Gly Leu Pro Ala Thr Ser Val Ala Trp Gly Leu Trp Gly
    2360                2365                2370

GGG GGA GGC ATG GCG GCG GGT GCG GGC GAG GAG AGT CTG TCG CGG CGA      7985
Gly Gly Gly Met Ala Ala Gly Ala Gly Glu Glu Ser Leu Ser Arg Arg
2375                2380                2385                2390

GGG CTG CGG GCC ATG GAC CCC GAC GCG GCC GTC GAC GCG CTC CTG GGC      8033
Gly Leu Arg Ala Met Asp Pro Asp Ala Ala Val Asp Ala Leu Leu Gly
                2395                2400                2405

GCC ATG GGC AGG AAC GAC GTG TGC GTC ACT GTC GTC GAC GTC GAC TGG      8081
Ala Met Gly Arg Asn Asp Val Cys Val Thr Val Val Asp Val Asp Trp
            2410                2415                2420

GAG CGT TTC GCG CCC GCG ACG AAC GCC ATC CGT CCC GGG CGG CTG TTC      8129
Glu Arg Phe Ala Pro Ala Thr Asn Ala Ile Arg Pro Gly Arg Leu Phe
        2425                2430                2435

GAC ACC GTG CCG GAG GCG CGG GAG GCC CTG ACG GCA GCC GGC ACC ACG      8177
Asp Thr Val Pro Glu Ala Arg Glu Ala Leu Thr Ala Ala Gly Thr Thr
    2440                2445                2450

TCC GCG ACG CCG GAC GGC GCG CCC GAG CTG GCG CGG CGG TTG TCC ATG      8225
Ser Ala Thr Pro Asp Gly Ala Pro Glu Leu Ala Arg Arg Leu Ser Met
2455                2460                2465                2470
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CTG AAC GAG ACC GAA CGC CTG CGG AAG CTG GTC GAA CTC GTC CGT ACC      8273
Leu Asn Glu Thr Glu Arg Leu Arg Lys Leu Val Glu Leu Val Arg Thr
                2475                2480                2485

GAG GCG GCC TTT GTG CTG CGG CAT CCG AAC ACG GAC GCC ATC GGC GCC      8321
Glu Ala Ala Phe Val Leu Arg His Pro Asn Thr Asp Ala Ile Gly Ala
            2490                2495                2500

GAA CGC CCG TTC AAG TCG GCC GGT TTC GAC TCC CTG ACC TCC CTG GAA      8369
Glu Arg Pro Phe Lys Ser Ala Gly Phe Asp Ser Leu Thr Ser Leu Glu
        2505                2510                2515

CTC CGC AAC CGC CTC AAT GCC GGC ACA GGC CTG AAG CTA CCC GCC ACC      8417
Leu Arg Asn Arg Leu Asn Ala Gly Thr Gly Leu Lys Leu Pro Ala Thr
    2520                2525                2530

GTC ATC TTC GAC CAC CCC AGC CCG ACC GCC CTG GCC AGA CTG CTG CTC      8465
Val Ile Phe Asp His Pro Ser Pro Thr Ala Leu Ala Arg Leu Leu Leu
2535                2540                2545                2550

GAC CGG CTG ACC GGC GCC GGA GCC CCC GCG CCC GCC GCC GAT GAG CCG      8513
Asp Arg Leu Thr Gly Ala Gly Ala Pro Ala Pro Ala Ala Asp Glu Pro
                2555                2560                2565

CCA CTG CCC GTC GCC GTG GCC GAC GAC GAC CCG GTG GTC ATC GTC GGC      8561
Pro Leu Pro Val Ala Val Ala Asp Asp Asp Pro Val Val Ile Val Gly
            2570                2575                2580

ATG GCG TGC CGT TTC CCC GGT GGG GCG GGC ACC CCT GAG GCG CTG TGG      8609
Met Ala Cys Arg Phe Pro Gly Gly Ala Gly Thr Pro Glu Ala Leu Trp
        2585                2590                2595

AAG CTG GTG ACC GAG GAG CGT GAC GTC ATA GGC GCC GCG CCC ACC GAC      8657
Lys Leu Val Thr Glu Glu Arg Asp Val Ile Gly Ala Ala Pro Thr Asp
    2600                2605                2610

CGG GGC TGG GAC CTG GAT TCC GTC TAC GAC CCG GAG CCG GGT GTG GCG      8705
Arg Gly Trp Asp Leu Asp Ser Val Tyr Asp Pro Glu Pro Gly Val Ala
2615                2620                2625                2630

GGG AAG ACA TAT GTG CGG GAG GGG GGT TTT CTC CAC GAC GCG GCG GAG      8753
Gly Lys Thr Tyr Val Arg Glu Gly Gly Phe Leu His Asp Ala Ala Glu
                2635                2640                2645

TTC GAC GCG GAG TTC TTC GGG ATT TCG CCG CGT GAG GCG GTG GCG ATG      8801
Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg Glu Ala Val Ala Met
            2650                2655                2660

GAT CCG CAG CAG CGG CTG TTG CTG GAG ACC TCC TGG GAG GCG ATC GAG      8849
Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Ile Glu
        2665                2670                2675

CGG GCG GGT ATC GAC CCG CAC TCG CTG CAC GGC AGC CGC ACC GGG GTA      8897
Arg Ala Gly Ile Asp Pro His Ser Leu His Gly Ser Arg Thr Gly Val
    2680                2685                2690

TAC GTC GGG CTG ACC CAT CAG GAG TAC GCC TCC CGG CTG CAC GAG GCC      8945
Tyr Val Gly Leu Thr His Gln Glu Tyr Ala Ser Arg Leu His Glu Ala
2695                2700                2705                2710
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CCG GAG GAG TAC GAA GGC TAT CTG CTC ACC GGC AAG TCG GCG AGC GTC      8993
Pro Glu Glu Tyr Glu Gly Tyr Leu Leu Thr Gly Lys Ser Ala Ser Val
                2715                2720                2725

GTC TCC GGC CGC ATC TCG TAC ACG CTG GGG CTG GAG GGT CCT TCG CTC      9041
Val Ser Gly Arg Ile Ser Tyr Thr Leu Gly Leu Glu Gly Pro Ser Leu
            2730                2735                2740

TCC ATC GAC ACC GCG TGT TCG TCG TCG CTG GTC GCC CTG CAC AAC GCG      9089
Ser Ile Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu His Asn Ala
        2745                2750                2755

GCG CAG GCG TTG CGG GGT GGC GAG TGT GAC ATG GCG TTG GCC GGT GGT      9137
Ala Gln Ala Leu Arg Gly Gly Glu Cys Asp Met Ala Leu Ala Gly Gly
    2760                2765                2770

GTG ACG GTG ATG GCG GCA CCC GGA TTG TTC GTG GAG TTT TCG CGG CAG      9185
Val Thr Val Met Ala Ala Pro Gly Leu Phe Val Glu Phe Ser Arg Gln
2775                2780                2785                2790

CGG GGG TTG GCG GCC GAT GGG CGG TGC AAG GCG TTC GCG GAT GGG GCG      9233
Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys Ala Phe Ala Asp Gly Ala
                2795                2800                2805

GAT GGG ACC GCT TGG GCC GAG GGT GCG GGG GTG GTG CTG GTG GAG CGG      9281
Asp Gly Thr Ala Trp Ala Glu Gly Ala Gly Val Val Leu Val Glu Arg
            2810                2815                2820

TTG TCG GAT GCC CGG CGG TTG GGG CAT CCG GTG TTG GCG GTG GTG TGT      9329
Leu Ser Asp Ala Arg Arg Leu Gly His Pro Val Leu Ala Val Val Cys
        2825                2830                2835

GGG TCG GCG GTG AAT CAG GAC GGT GCG TCG AAT GGT TTG ACG GCG CCG      9377
Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro
    2840                2845                2850

AGT GGT CCG TCG CAG GAG CGG GTG ATT CGT CAG GCG TTG GCG AAT GCG      9425
Ser Gly Pro Ser Gln Glu Arg Val Ile Arg Gln Ala Leu Ala Asn Ala
2855                2860                2865                2870

CGG TTG ACG GTG GCG GAT GTG GAT GTG GTG GAG GCG CAT GGG ACG GGG      9473
Arg Leu Thr Val Ala Asp Val Asp Val Val Glu Ala His Gly Thr Gly
                2875                2880                2885

ACG CGG CTG GGT GAT CCG ATC GAG GCG CAG GCG TTG CTG GGG ACG TAT      9521
Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu Gly Thr Tyr
            2890                2895                2900

GGG CGG GAT CGT GAT GCT GAG TGT CCG GTG TGG TTG GGG TCG TTG AAG      9569
Gly Arg Asp Arg Asp Ala Glu Cys Pro Val Trp Leu Gly Ser Leu Lys
        2905                2910                2915

TCG AAT ATT GGT CAT GCT CAG GCG GCT GCG GGG GTG GCT GGT GTG ATC      9617
Ser Asn Ile Gly His Ala Gln Ala Ala Ala Gly Val Ala Gly Val Ile
    2920                2925                2930

AAG ATG GTG TTG GCG ATG CGG TAT GGG TGG TTG CCG CGG ACG TTG CAT      9665
Lys Met Val Leu Ala Met Arg Tyr Gly Trp Leu Pro Arg Thr Leu His
2935                2940                2945                2950
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GTG GAT GAG CCG AGC CGG CAT GTG GAC TGG TCG GCT GGT GGT GTG CGG      9713
Val Asp Glu Pro Ser Arg His Val Asp Trp Ser Ala Gly Gly Val Arg
                2955                2960                2965

TTG CTG ACC GAG GCG CGG GAG TGG CCG GGG GTG GAC CGG CCG CGT CGG      9761
Leu Leu Thr Glu Ala Arg Glu Trp Pro Gly Val Asp Arg Pro Arg Arg
            2970                2975                2980

GCG GCG GTC TCC GCC TTC GGT GTC AGT GGT ACC AAC GCC CAT CTG ATC      9809
Ala Ala Val Ser Ala Phe Gly Val Ser Gly Thr Asn Ala His Leu Ile
        2985                2990                2995

CTC GAA GCC CCC GAA GCC CTC GAA GCC CTC GAA GCC ACC GAC GCC CCC      9857
Leu Glu Ala Pro Glu Ala Leu Glu Ala Leu Glu Ala Thr Asp Ala Pro
    3000                3005                3010

GAA GCC CCC GAA GCC CCC GAA GCC CCC GAC GTC ACC GAC GTC ACC GAA      9905
Glu Ala Pro Glu Ala Pro Glu Ala Pro Asp Val Thr Asp Val Thr Glu
3015                3020                3025                3030

GCC CTC GAA GCC CCC GAC GCC ACC GAG GCG GAG GGT GCG AAG GCT CCT      9953
Ala Leu Glu Ala Pro Asp Ala Thr Glu Ala Glu Gly Ala Lys Ala Pro
                3035                3040                3045

GGC AGT CCC GAA GAG GCA CAG CCT GCT GTG GGT GTG GTG CCG GTG GTG     10001
Gly Ser Pro Glu Glu Ala Gln Pro Ala Val Gly Val Val Pro Val Val
            3050                3055                3060

GTT TCG GGG CGT TCG CGG GTG GTG GTG CGG GAG GCT GCG GGC CGG TTG     10049
Val Ser Gly Arg Ser Arg Val Val Val Arg Glu Ala Ala Gly Arg Leu
        3065                3070                3075

GCG GAG GTG GTG GAG GCC GGT GGT GTG GGG CTG GCG GAT GTG GCG GTG     10097
Ala Glu Val Val Glu Ala Gly Gly Val Gly Leu Ala Asp Val Ala Val
    3080                3085                3090

ACG ATG GCG GGC CGG TCG CGG TTT GGG TAT CGG GCG GTT GTG CTG GCT     10145
Thr Met Ala Gly Arg Ser Arg Phe Gly Tyr Arg Ala Val Val Leu Ala
3095                3100                3105                3110

CGG GGT GAG GCT GAG CTT GCC GGG CGT TTG CGG GCG TTG GCG GGG GGT     10193
Arg Gly Glu Ala Glu Leu Ala Gly Arg Leu Arg Ala Leu Ala Gly Gly
                3115                3120                3125

GAT CCG GAC GCG GGT GTG GTC ACC GGT GCG GTG GTG GAC CCG GAG ACG     10241
Asp Pro Asp Ala Gly Val Val Thr Gly Ala Val Val Asp Pro Glu Thr
            3130                3135                3140

GGG TCC GGT GGT GGG GGC GTG GTG TTG GTT TTC CCT GGT CAG GGG ACG     10289
Gly Ser Gly Gly Gly Gly Val Val Leu Val Phe Pro Gly Gln Gly Thr
        3145                3150                3155

CAG TGG GTG GGG ATG GGT GCG GGG CTG CTG GGG TCT TCG GAG GTG TTT     10337
Gln Trp Val Gly Met Gly Ala Gly Leu Leu Gly Ser Ser Glu Val Phe
    3160                3165                3170

GCG GCG TCG ATG CGG GAG TGT GCG CGG GCG CTG AGT GTT CAT GTG GAG     10385
Ala Ala Ser Met Arg Glu Cys Ala Arg Ala Leu Ser Val His Val Glu
3175                3180                3185                3190
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TGG GAT TTG CTG GAG GTG GTG TCG GGC GGG GCC GGG TTG GAG CGG GTG      10433
Trp Asp Leu Leu Glu Val Val Ser Gly Gly Ala Gly Leu Glu Arg Val
                3195                3200                3205

GAT GTG GTG CAG CCC GTG ACG TGG GCG GTG ATG GTG TCG CTG GCC CGG      10481
Asp Val Val Gln Pro Val Thr Trp Ala Val Met Val Ser Leu Ala Arg
            3210                3215                3220

TAC TGG CAG GCG ATG GGT GTG GAC GTG GCT GCG GTG GTG GGT CAT TCC      10529
Tyr Trp Gln Ala Met Gly Val Asp Val Ala Ala Val Val Gly His Ser
        3225                3230                3235

CAG GGG GAG ATC GCT GCT GCC ACG GTG GCG GGG GCG TTG TCG CTG GAG      10577
Gln Gly Glu Ile Ala Ala Ala Thr Val Ala Gly Ala Leu Ser Leu Glu
    3240                3245                3250

GAT GCG GCG GCT GTG GTC GCT CTG CGG GCG GGG TTG ATT GGC CGG TAT      10625
Asp Ala Ala Ala Val Val Ala Leu Arg Ala Gly Leu Ile Gly Arg Tyr
3255                3260                3265                3270

CTG GCG GGT CGT GGT GCG ATG GCG GCT GTT CCG CTG CCT GCC GGC GAG      10673
Leu Ala Gly Arg Gly Ala Met Ala Ala Val Pro Leu Pro Ala Gly Glu
                3275                3280                3285

GTC GAG GCC GGG CTG GCG AAG TGG CCC GGA GTA CAG GTA GCC GCG GTC      10721
Val Glu Ala Gly Leu Ala Lys Trp Pro Gly Val Gln Val Ala Ala Val
            3290                3295                3300

AAC GGT CCG GCG TCC ACG GTG GTT TCC GGG GAT CGG CGG GCG GTG GCC      10769
Asn Gly Pro Ala Ser Thr Val Val Ser Gly Asp Arg Arg Ala Val Ala
        3305                3310                3315

GGT TAT GTG GCC GTC TGT CAG GCG GAG GGT GTG CAG GCT CGG TTG ATA      10817
Gly Tyr Val Ala Val Cys Gln Ala Glu Gly Val Gln Ala Arg Leu Ile
    3320                3325                3330

CCG GTG GAC TAC GCC TCT CAC TCC CGC CAT GTG GAG GAC CTG AAG GGC      10865
Pro Val Asp Tyr Ala Ser His Ser Arg His Val Glu Asp Leu Lys Gly
3335                3340                3345                3350

GAG TTG GAG CGG GTG CTG TCC GGT ATC CGC CCC CGC AGT CCG CGG GTG      10913
Glu Leu Glu Arg Val Leu Ser Gly Ile Arg Pro Arg Ser Pro Arg Val
                3355                3360                3365

CCG GTG TGT TCC ACC GTC GCC GGA GAG CAG CCG GGC GAG CCG GTT TTC      10961
Pro Val Cys Ser Thr Val Ala Gly Glu Gln Pro Gly Glu Pro Val Phe
            3370                3375                3380

GAT GCG GGG TAT TGG TTC CGT AAT CTG CGG AAC CGG GTT GAG TTC TCC      11009
Asp Ala Gly Tyr Trp Phe Arg Asn Leu Arg Asn Arg Val Glu Phe Ser
        3385                3390                3395

GCG GTG GTC GGT GGT TTG TTG GAG CAG GGC CAC CGT CGG TTC ATC GAG      11057
Ala Val Val Gly Gly Leu Leu Glu Gln Gly His Arg Arg Phe Ile Glu
    3400                3405                3410

GTC AGT GCC CAC CCG GTA CTC GTC CAT GCC ATT GAG CAG ACG GCC GAG      11105
Val Ser Ala His Pro Val Leu Val His Ala Ile Glu Gln Thr Ala Glu
3415                3420                3425                3430
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GCC GCG GAC CGG AGT GTC CAT GCC ACC GGA ACC CTG CGC CGC CAG GAC      11153
Ala Ala Asp Arg Ser Val His Ala Thr Gly Thr Leu Arg Arg Gln Asp
                3435                3440                3445

GAC AGC CCG CAC CGC CTG CTG ACC TCC ACC GCC GAG GCC TGG GCC CAC      11201
Asp Ser Pro His Arg Leu Leu Thr Ser Thr Ala Glu Ala Trp Ala His
            3450                3455                3460

GGC GCC ACC CTC ACC TGG GAC CCC GCC CTG CCC CCA GGT CAC CTC ACC      11249
Gly Ala Thr Leu Thr Trp Asp Pro Ala Leu Pro Pro Gly His Leu Thr
        3465                3470                3475

ACC CTC CCC ACC TAC CCC TTC AAC CAC CAC CAC TAC TGG GCC GTG ACA      11297
Thr Leu Pro Thr Tyr Pro Phe Asn His His His Tyr Trp Ala Val Thr
    3480                3485                3490

TCC CCC GCC GGA GTC GGC GAC GCG GCT GCG GGC CGG TTC GGT ATG ACC      11345
Ser Pro Ala Gly Val Gly Asp Ala Ala Ala Gly Arg Phe Gly Met Thr
3495                3500                3505                3510

TGG GAG GAC CAC CCC TTC CTC CGT GGC GGG TTA CCC CTG GCC GAC TCC      11393
Trp Glu Asp His Pro Phe Leu Arg Gly Gly Leu Pro Leu Ala Asp Ser
                3515                3520                3525

GGT GAG CGG GTG TTC GCC GGG CGG CTG GCG GGC TCC GAG CAC GAC TGG      11441
Gly Glu Arg Val Phe Ala Gly Arg Leu Ala Gly Ser Glu His Asp Trp
            3530                3535                3540

CTG ACG GAC CAT GCC GTG TCC GGG GTG ACG TTG CTG CCG GGT ACG GCC      11489
Leu Thr Asp His Ala Val Ser Gly Val Thr Leu Leu Pro Gly Thr Ala
        3545                3550                3555

TTC GTG GAG TTC GCG CTG CAC GCG GGA GCC GCC ACC GGC TGC GGG CGG      11537
Phe Val Glu Phe Ala Leu His Ala Gly Ala Ala Thr Gly Cys Gly Arg
    3560                3565                3570

CTG GAA GAG CTG AGC GTT GAG GCG CCG TTG GTC TTG CCC GCC GCC GGT      11585
Leu Glu Glu Leu Ser Val Glu Ala Pro Leu Val Leu Pro Ala Ala Gly
3575                3580                3585                3590

GGT GTG CGG GTG CAG ATG AGG GTG TCG GCC GCC GAC GAG TCG GGA CGG      11633
Gly Val Arg Val Gln Met Arg Val Ser Ala Ala Asp Glu Ser Gly Arg
                3595                3600                3605

CGG AGG GTC GCC ATC CAC TCG GCC CCG GAA GCC GCC GTC CAC TCG GCC      11681
Arg Arg Val Ala Ile His Ser Ala Pro Glu Ala Ala Val His Ser Ala
            3610                3615                3620

GCA GAA GGC GGC GAC TCG GCC GGT GTC TGG ACG CGG CAC GGC GAG GGC      11729
Ala Glu Gly Gly Asp Ser Ala Gly Val Trp Thr Arg His Gly Glu Gly
        3625                3630                3635

ACG CTC GTG CCG GAC CCG GAG CCC ACG CCT CCG GAC GCC GAC TGG GCG      11777
Thr Leu Val Pro Asp Pro Glu Pro Thr Pro Pro Asp Ala Asp Trp Ala
    3640                3645                3650

CGG GCC TGG CCG CCC GCC GGG GAA CGC GTC GAA CCG GCC GAG CTC TAC      11825
Arg Ala Trp Pro Pro Ala Gly Glu Arg Val Glu Pro Ala Glu Leu Tyr
3655                3660                3665                3670
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GAA CGG TTC GGG GCC CTG GGC TAC GAG TAC GGT GAG GCG TTC GCG GGC      11873
Glu Arg Phe Gly Ala Leu Gly Tyr Glu Tyr Gly Glu Ala Phe Ala Gly
                3675                3680                3685

GTG CGC GCC GTA TGG CGG CAG CCG GAC GCG CTG CTC GCC GAG GTG CTC      11921
Val Arg Ala Val Trp Arg Gln Pro Asp Ala Leu Leu Ala Glu Val Leu
            3690                3695                3700

CTG CCC GAC CGG GCC TCG ACC GGT GCC GGC CGG TTC GGT GTG CAC CCC      11969
Leu Pro Asp Arg Ala Ser Thr Gly Ala Gly Arg Phe Gly Val His Pro
        3705                3710                3715

GCG CTG CTG GAC GCG GCG CTG CAG CCG TGG ATC GCC GGT GGT CTC CTC      12017
Ala Leu Leu Asp Ala Ala Leu Gln Pro Trp Ile Ala Gly Gly Leu Leu
    3720                3725                3730

GAA GTG CCG GAG GAC GCA GTG CTG CTG CCC TTC GCC TGG CAG GGA GTG      12065
Glu Val Pro Glu Asp Ala Val Leu Leu Pro Phe Ala Trp Gln Gly Val
3735                3740                3745                3750

TCG CTC TAC GCG ACG GGT GCC GGT GCT CTG CGG GTG CGG CTG ACG AAG      12113
Ser Leu Tyr Ala Thr Gly Ala Gly Ala Leu Arg Val Arg Leu Thr Lys
                3755                3760                3765

GCG GGT GAC GGG GCG GTC TCG CTC CAG GCC GCA GAC ACG TCC GGC GCG      12161
Ala Gly Asp Gly Ala Val Ser Leu Gln Ala Ala Asp Thr Ser Gly Ala
            3770                3775                3780

GCC GTG CTC TCC TTG GGG GCC CTG GTG ATG CGT CCG CTG GCG CGC CGG      12209
Ala Val Leu Ser Leu Gly Ala Leu Val Met Arg Pro Leu Ala Arg Arg
        3785                3790                3795

AAG CTG GAC GTG CTG CTC GGC ACG GAC GCC GGC GAA CGG TCG CTG TAC      12257
Lys Leu Asp Val Leu Leu Gly Thr Asp Ala Gly Glu Arg Ser Leu Tyr
    3800                3805                3810

CGC GTC GAG TGG CAG CCG CGG CTC CTG CCC GCC GGC CCG CCG CGC TCC      12305
Arg Val Glu Trp Gln Pro Arg Leu Leu Pro Ala Gly Pro Pro Arg Ser
3815                3820                3825                3830

TGG GCG GTG CTC GGC CCC GAC GCG GAC CGG CTC GCC GGG ACG CCG GGC      12353
Trp Ala Val Leu Gly Pro Asp Ala Asp Arg Leu Ala Gly Thr Pro Gly
                3835                3840                3845

CTG GGG GAT CAG CCG GAC GGT GGG CCC ACC GCG CTG TAC CCG GAG GTG      12401
Leu Gly Asp Gln Pro Asp Gly Gly Pro Thr Ala Leu Tyr Pro Glu Val
            3850                3855                3860

CGG GCG CTG CGG AAG GCG CTG GCG GCG GGC GCG CCG CGG CCG GAA GCG      12449
Arg Ala Leu Arg Lys Ala Leu Ala Ala Gly Ala Pro Arg Pro Glu Ala
        3865                3870                3875

GTC GTA CTG CCG GTG CTC TCC GGG GCC GGG GCC ACT CCG GAG TCG GTG      12497
Val Val Leu Pro Val Leu Ser Gly Ala Gly Ala Thr Pro Glu Ser Val
    3880                3885                3890

CGG CAG ACA ACG GAG CGC TGT CTG ACC GCG CTC CAG GAC TGG CTG GAC      12545
Arg Gln Thr Thr Glu Arg Cys Leu Thr Ala Leu Gln Asp Trp Leu Asp
3895                3900                3905                3910
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GCC GAG GAG TTG GTG GAC ACA CCG CTC ATA GTG CTC ACC AGG GGA GCC      12593
Ala Glu Glu Leu Val Asp Thr Pro Leu Ile Val Leu Thr Arg Gly Ala
                3915                3920                3925

GTC GCC GCC GTA CCG GGG GAG GAG ATC GGG GAC CTG GCG TGT GCG GGG      12641
Val Ala Ala Val Pro Gly Glu Glu Ile Gly Asp Leu Ala Cys Ala Gly
            3930                3935                3940

GTG TGG GGC CTG GTG AGG TCC GCG CGG TCC GAG CAC CCG GGC CGC TTC      12689
Val Trp Gly Leu Val Arg Ser Ala Arg Ser Glu His Pro Gly Arg Phe
        3945                3950                3955

GCC CTC GTC GAC ACC GAC GGG CAT CCG GAC GAC CGC ACC GCG CTG CCC      12737
Ala Leu Val Asp Thr Asp Gly His Pro Asp Asp Arg Thr Ala Leu Pro
    3960                3965                3970

CTC GCG CTG CGC GCG GTC CTC GAC GGC GCC GGC CAG CTC TCC CTG CGG      12785
Leu Ala Leu Arg Ala Val Leu Asp Gly Ala Gly Gln Leu Ser Leu Arg
3975                3980                3985                3990

GCC GGC ACC GCC CGG ACC CCG GTC CTC CTC CGG GCC GGG ACC CCG GAG      12833
Ala Gly Thr Ala Arg Thr Pro Val Leu Leu Arg Ala Gly Thr Pro Glu
                3995                4000                4005

GAG CAG CGG GGT CCG GCA TTC GAC CCG GCG GGC ACG GTC CTG GTG ACG      12881
Glu Gln Arg Gly Pro Ala Phe Asp Pro Ala Gly Thr Val Leu Val Thr
            4010                4015                4020

GGC GCG ACC GGC ACG CTC GGG CGG CTG CTG GCC CGG CAT CTG GCC GCC      12929
Gly Ala Thr Gly Thr Leu Gly Arg Leu Leu Ala Arg His Leu Ala Ala
        4025                4030                4035

GAG CAC GGT GTG CGC CAT CTG CTG CTG CTG AGC CGC GGC GGC CGG GCT      12977
Glu His Gly Val Arg His Leu Leu Leu Leu Ser Arg Gly Gly Arg Ala
    4040                4045                4050

GCC GAA GGC GCG GAC GAA CTC GCC GCG GAA CTG GCC GGG TTG GAA GCC      13025
Ala Glu Gly Ala Asp Glu Leu Ala Ala Glu Leu Ala Gly Leu Glu Ala
4055                4060                4065                4070

GAG CCG TGC TTC GCG GCC TGT GAC GCG GCG GAC CGC GAG GCC CTG GCA      13073
Glu Pro Cys Phe Ala Ala Cys Asp Ala Ala Asp Arg Glu Ala Leu Ala
                4075                4080                4085

CGG GTG CTG GCG GAG GTG CCG GCC GAC CGG CCG CTG ACC GGA GTG ATC      13121
Arg Val Leu Ala Glu Val Pro Ala Asp Arg Pro Leu Thr Gly Val Ile
            4090                4095                4100

CAC GCG GCC GGG GTG CTC GAC GAC GGC ACA CTC GAC GCG CTG ACC CCG      13169
His Ala Ala Gly Val Leu Asp Asp Gly Thr Leu Asp Ala Leu Thr Pro
        4105                4110                4115

GAA CGG ATC GGT ACC GTC ATG CGG CCG AAG GCG GAC GCG GCG CTG AAC      13217
Glu Arg Ile Gly Thr Val Met Arg Pro Lys Ala Asp Ala Ala Leu Asn
    4120                4125                4130

CTG CAC GAA CTG ACC CGG ACC AGC CCG CTG TCG GTG TTC GCG GTC TTC      13265
Leu His Glu Leu Thr Arg Thr Ser Pro Leu Ser Val Phe Ala Val Phe
4135                4140                4145                4150
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TCG GGC GCT GCC GGC ATC CTG GGC CGC CCC GGA CAG GCC AAC TAC GCC      13313
Ser Gly Ala Ala Gly Ile Leu Gly Arg Pro Gly Gln Ala Asn Tyr Ala
                4155                4160                4165

GCC GCC AAC ACC TTC CTC GAC GCG CTC GCG CAG CAC CGC CGC GCC CAC      13361
Ala Ala Asn Thr Phe Leu Asp Ala Leu Ala Gln His Arg Arg Ala His
            4170                4175                4180

GGC CTC CCC GCC GTG TCG CTG GCC TGG GGG CTG TGG GGC GGG GCG ACC      13409
Gly Leu Pro Ala Val Ser Leu Ala Trp Gly Leu Trp Gly Gly Ala Thr
        4185                4190                4195

GGC ATG ACC GGC CAT CTG TCC GGC ACC GAT CTG CGC CGG ATG CGC AGG      13457
Gly Met Thr Gly His Leu Ser Gly Thr Asp Leu Arg Arg Met Arg Arg
    4200                4205                4210

TCC GGT ATC GCG CCG ATG ACC CAC GAC CAG GGG CTC GCC CTG TTC GAC      13505
Ser Gly Ile Ala Pro Met Thr His Asp Gln Gly Leu Ala Leu Phe Asp
4215                4220                4225                4230

CGA GCG CTC GCC GCC TCG GCC GAG GAC CCG CTG CTC GTA CCG ATG CGG      13553
Arg Ala Leu Ala Ala Ser Ala Glu Asp Pro Leu Leu Val Pro Met Arg
                4235                4240                4245

CTG GAC CTG GCC GCC CTC GTC CGG GAG CGG GCC GAG CAC GGG CCG GAC      13601
Leu Asp Leu Ala Ala Leu Val Arg Glu Arg Ala Glu His Gly Pro Asp
            4250                4255                4260

GCG GTG CCC GGA CCG CTG CTC GGG CTG CTG CCC GCC CGG GCC GCG GTG      13649
Ala Val Pro Gly Pro Leu Leu Gly Leu Leu Pro Ala Arg Ala Ala Val
        4265                4270                4275

CGG CAG GCG GCG GCA CCG GTA CGC GGC GGA GCC CCC GCC CCC GCC GGC      13697
Arg Gln Ala Ala Ala Pro Val Arg Gly Gly Ala Pro Ala Pro Ala Gly
    4280                4285                4290

GGC GAG GGG ACG GCC GAG CGG CTG GCC GGG CTC GGG GAG GAG GCC AGG      13745
Gly Glu Gly Thr Ala Glu Arg Leu Ala Gly Leu Gly Glu Glu Ala Arg
4295                4300                4305                4310

CTG CGC GAG CTG GTG AGG CTG GTC CGC GCC GAG GTG TCG GGC GTG CTG      13793
Leu Arg Glu Leu Val Arg Leu Val Arg Ala Glu Val Ser Gly Val Leu
                4315                4320                4325

GGC TAC TCG GGC CCG GAC GCG GTG GAG CCC GGG CGC CCG TTC AAG GAT      13841
Gly Tyr Ser Gly Pro Asp Ala Val Glu Pro Gly Arg Pro Phe Lys Asp
            4330                4335                4340

CTC GGC TTC GAC TCG CTG ACC GCC GTG GAG CTG CGC AAC CGC CTC GGC      13889
Leu Gly Phe Asp Ser Leu Thr Ala Val Glu Leu Arg Asn Arg Leu Gly
        4345                4350                4355

GCC GCC ACC GGG CTG CGG CTG CCG ACC GCG CTG GTC TTC GAC CGC CCG      13937
Ala Ala Thr Gly Leu Arg Leu Pro Thr Ala Leu Val Phe Asp Arg Pro
    4360                4365                4370

ACG TCC CAG GCA GTG GCC GAG TAC CTC GCT GCC GAA CTG GCC GGA CCG      13985
Thr Ser Gln Ala Val Ala Glu Tyr Leu Ala Ala Glu Leu Ala Gly Pro
4375                4380                4385                4390
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CGG GAC GGC GGC GAC ACC GCG GCC GCC GCG TTC GAG GGC CTG GAG GCG      14033
Arg Asp Gly Gly Asp Thr Ala Ala Ala Ala Phe Glu Gly Leu Glu Ala
                4395                4400                4405

CTG GCC GCG GCG GTG GGC GCG CTG GCC GAG GAC GAT CTG CGG CGC GAC      14081
Leu Ala Ala Ala Val Gly Ala Leu Ala Glu Asp Asp Leu Arg Arg Asp
            4410                4415                4420

GTG CTC CGG CGG CGA CTG ACC GAA CTG GCC GCC GCG CTC ACC CCG CAG      14129
Val Leu Arg Arg Arg Leu Thr Glu Leu Ala Ala Ala Leu Thr Pro Gln
        4425                4430                4435

GGC CGG AAC CCC TCC GCG CCC GCA CCC GCC CCG TCC GAT CTG GAC GAG      14177
Gly Arg Asn Pro Ser Ala Pro Ala Pro Ala Pro Ser Asp Leu Asp Glu
    4440                4445                4450

CGG CTG GAC TCC GCG AAC GAC GAC GAC CTC TTC GCC TTC ATC GAG GAG      14225
Arg Leu Asp Ser Ala Asn Asp Asp Asp Leu Phe Ala Phe Ile Glu Glu
4455                4460                4465                4470

CAG CTT TGA GCAGCGAGAA CGACAGCAGC GAGAACGACG GCGACGACAC              14274
Gln Leu *

GGCCGGGGCA GCTCCGGGGA CGGCTCCGGG GGCCTCCCCC CGGCAGGACG ACCGGGTCAG   14334

GGAGTATCTG AAGCGG GTG ACC GCC GAA CTG GTC GCC ACC CGC AAG CGG        14383
                Met Thr Ala Glu Leu Val Ala Thr Arg Lys Arg
                1               5                   10

CTC GGC GCG CTG GAG GAG CGG GCC CGC GAA CCG ATC GCC GTC GTC GCG      14431
Leu Gly Ala Leu Glu Glu Arg Ala Arg Glu Pro Ile Ala Val Val Ala
            15                  20                  25

ATG AGC TGC CGC TAC CCG GGC GGG GTG ACG ACC CCC GAG GAC CTG TGG      14479
Met Ser Cys Arg Tyr Pro Gly Gly Val Thr Thr Pro Glu Asp Leu Trp
        30                  35                  40

CGG CTT CTC GCG GAC GAA CGC GAC GCC GTA TCC GGA CTT CCC CGG GAC      14527
Arg Leu Leu Ala Asp Glu Arg Asp Ala Val Ser Gly Leu Pro Arg Asp
    45                  50                  55

CGC GGC TGG GAC CTG GAC GCC CTC TAC GAC CCC GAC GGC GGC CCC GGC      14575
Arg Gly Trp Asp Leu Asp Ala Leu Tyr Asp Pro Asp Gly Gly Pro Gly
60                  65                  70                  75

ACC AGC TAC GCC CGC GAA GGC GGC TTC CTG AGC CAC TGC GCC GGA TTC      14623
Thr Ser Tyr Ala Arg Glu Gly Gly Phe Leu Ser His Cys Ala Gly Phe
                80                  85                  90

GAC GCG GAG TTC TTC GGC ATC TCC CCG CGC GAG GCG CTG GCG ATG GAC      14671
Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp
            95                  100                 105

CCG CAG CAG CGG CTG CTG CTG GAG ACC TCC TGG GAG GCC CTG GAA CGC      14719
Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Leu Glu Arg
        110                 115                 120

GCC GGA GTC ACC GCC GAC CGC GCC CGG GGC AGC CGG ACG GGC GTG TAC      14767
Ala Gly Val Thr Ala Asp Arg Ala Arg Gly Ser Arg Thr Gly Val Tyr
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     125                 130                 135

GCG GGC GTC ATG TAC GAC GAC TAC GGC GCC CGG GTG CTG TAC GGC GCC      14815
Ala Gly Val Met Tyr Asp Asp Tyr Gly Ala Arg Val Leu Tyr Gly Ala
140                 145                 150                 155

GGC GCC GGC CCG CCC GAG GAC CTG GAG GGT TAT CTC GTC AAC GGC AGC      14863
Gly Ala Gly Pro Pro Glu Asp Leu Glu Gly Tyr Leu Val Asn Gly Ser
                160                 165                 170

GCG GGC AGC ATC GCC TCC GGC CGT GTC TCC TAC ACG TTC GGG CTG CGC      14911
Ala Gly Ser Ile Ala Ser Gly Arg Val Ser Tyr Thr Phe Gly Leu Arg
            175                 180                 185

GGC CCC GCG GTC ACC GTC AAT ACG GCC TGT TCG TCG TCA CTG GTG TCG      14959
Gly Pro Ala Val Thr Val Asn Thr Ala Cys Ser Ser Ser Leu Val Ser
        190                 195                 200

CTC CAT CTG GCG GTG CGT GCC CTG CGG AAC GGC GAG TGC GAC ATG GCA      15007
Leu His Leu Ala Val Arg Ala Leu Arg Asn Gly Glu Cys Asp Met Ala
    205                 210                 215

CTG GCC GGC GGG GCG ACG GTG CTG TCC ACC CCC ACC GTG CTC GTG GAC      15055
Leu Ala Gly Gly Ala Thr Val Leu Ser Thr Pro Thr Val Leu Val Asp
220                 225                 230                 235

TTC TCC CGC CAG CGC GGT CTG GCC CCC GAC GGC CGC TGC AAG GCG TTC      15103
Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe
                240                 245                 250

GCC GAC TCC GCC GAC GGC ACC TCC TGG GCC GAG GGC GCC GGA ATG CTG      15151
Ala Asp Ser Ala Asp Gly Thr Ser Trp Ala Glu Gly Ala Gly Met Leu
            255                 260                 265

CTG CTC CAG CGG CTG TCC GAC GCC CGC CGC GAG GGG CGC CCC GTG CTG      15199
Leu Leu Gln Arg Leu Ser Asp Ala Arg Arg Glu Gly Arg Pro Val Leu
        270                 275                 280

GCC GTC ATT CGC GGC TCG GCC GTC AAC CAG GAC GGC GCC AGC AAC GGA      15247
Ala Val Ile Arg Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly
    285                 290                 295

CTG ACC GCC CCC AAC GGG CGG GCG CAG CGG CAG GTC ATC GAG GAC GCG      15295
Leu Thr Ala Pro Asn Gly Arg Ala Gln Arg Gln Val Ile Glu Asp Ala
300                 305                 310                 315

CTG CGC GAC GCC GGG GTC GGC CCC GAC CAG GTG GAC GCG GTC GAG GCG      15343
Leu Arg Asp Ala Gly Val Gly Pro Asp Gln Val Asp Ala Val Glu Ala
                320                 325                 330

CAT GGC ACC GGT ACC GAG CTG GGC GAC CCC ATC GAG GCC GGG GCG CTG      15391
His Gly Thr Gly Thr Glu Leu Gly Asp Pro Ile Glu Ala Gly Ala Leu
            335                 340                 345

CTC GCC ACC TAT GGA ACG GCC CGT ACG GCG GAG CGC CCG CTG TGG CTC      15439
Leu Ala Thr Tyr Gly Thr Ala Arg Thr Ala Glu Arg Pro Leu Trp Leu
        350                 355                 360

GGC TCC CTG AAG TCC AAC ATC GGG CAC ACC CAG GCC GCC GCC GGT GTT      15487
Gly Ser Leu Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala Gly Val
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     365                 370                 375

GCG GGC GTC ATC AAG ATG GTG CTG GCG ATG CGG CAC GGC CGG CTG CCC      15535
Ala Gly Val Ile Lys Met Val Leu Ala Met Arg His Gly Arg Leu Pro
380                 385                 390                 395

CGC ACC CTG CAC GTG GAC CGG CCC ACC ACC CGG GTG GAC TGG GAG AAG      15583
Arg Thr Leu His Val Asp Arg Pro Thr Thr Arg Val Asp Trp Glu Lys
                400                 405                 410

GGC GGG GTG CGG CTC CTC ACG GAG CCG GTG CCA TGG CCG GGG GAA GCG      15631
Gly Gly Val Arg Leu Leu Thr Glu Pro Val Pro Trp Pro Gly Glu Ala
            415                 420                 425

GGG GAG CCG CGT CGC GCG GGC GTG TCC TCC TTC GGC GCG AGC GGC ACG      15679
Gly Glu Pro Arg Arg Ala Gly Val Ser Ser Phe Gly Ala Ser Gly Thr
        430                 435                 440

AAC GCG CAT GTG GTG CTG GAG AGC GTC CCG GCC GGT GAA CCG CCC GCC      15727
Asn Ala His Val Val Leu Glu Ser Val Pro Ala Gly Glu Pro Pro Ala
    445                 450                 455

GCC GGG CGG CCG GAG GAC ACA GGC GGC GCC TGG ACG GTC AGC GGC CGC      15775
Ala Gly Arg Pro Glu Asp Thr Gly Gly Ala Trp Thr Val Ser Gly Arg
460                 465                 470                 475

GGC CCG GCG GCC CTG CGC GCC CAG GCC GCC CGG CTG TAC GAC GCG CTC      15823
Gly Pro Ala Ala Leu Arg Ala Gln Ala Ala Arg Leu Tyr Asp Ala Leu
                480                 485                 490

ACC GGC ACC GGC ACC GGC ACC GGA CAG GGC GCC GGA CAG GGC GCC GGA      15871
Thr Gly Thr Gly Thr Gly Thr Gly Gln Gly Ala Gly Gln Gly Ala Gly
            495                 500                 505

CCC GGC ACC GCC GAG GTG GCC GGC GCG CTG GCC CAC GCC CGT ACC GCG      15919
Pro Gly Thr Ala Glu Val Ala Gly Ala Leu Ala His Ala Arg Thr Ala
        510                 515                 520

TTC CGG CAC CGG GCC GTC GTG CTC GGC GGA AAC CGC GCC GAA CTG CTC      15967
Phe Arg His Arg Ala Val Val Leu Gly Gly Asn Arg Ala Glu Leu Leu
    525                 530                 535

GCG GGG CTG CGC GAG CTG GCG GAG GAG GAG CAT CCC GGA CCC CGC GTG      16015
Ala Gly Leu Arg Glu Leu Ala Glu Glu Glu His Pro Gly Pro Arg Val
540                 545                 550                 555

GTC ACA GGG ACC GCC CCG GCC ACC GAG CGG CGG ACG GCC TTC CTC TTC      16063
Val Thr Gly Thr Ala Pro Ala Thr Glu Arg Arg Thr Ala Phe Leu Phe
                560                 565                 570

TCC GGG CAG GGC AGC CAG CGG GCC GGC TCC GGC CGG GGC CTG TAC CGC      16111
Ser Gly Gln Gly Ser Gln Arg Ala Gly Ser Gly Arg Gly Leu Tyr Arg
            575                 580                 585

CGC CAC CCG GTC TTC GCC CGC GCC CTC GAC GAG GTG TGC GCC GCG CTC      16159
Arg His Pro Val Phe Ala Arg Ala Leu Asp Glu Val Cys Ala Ala Leu
        590                 595                 600

GAA CCG CAT CTT CAC CGC CCC CTG CGT GAC CTG ATG TTC GCC GAG CCC      16207
Glu Pro His Leu His Arg Pro Leu Arg Asp Leu Met Phe Ala Glu Pro
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     605                 610                 615

GGC AGC CCG GAA GCG GAG CCG CTC GAC CGC ACC GAG TTC ACC CAG CCC      16255
Gly Ser Pro Glu Ala Glu Pro Leu Asp Arg Thr Glu Phe Thr Gln Pro
620                 625                 630                 635

GCG CTG TTC GCG CTC CAG ACC GCC CTG TTC CGG CTG GCC GAG CAC CAC      16303
Ala Leu Phe Ala Leu Gln Thr Ala Leu Phe Arg Leu Ala Glu His His
                640                 645                 650

GGG CTG CGC GCC GAG GCG CTG TGC GGG CAC AGC GTC GGC GAG ATC GCG      16351
Gly Leu Arg Ala Glu Ala Leu Cys Gly His Ser Val Gly Glu Ile Ala
            655                 660                 665

GCC GCC CAT GCC GCC GGT GTG CTG ACC CTG CCC GAC GCG GCC CGT CTG      16399
Ala Ala His Ala Ala Gly Val Leu Thr Leu Pro Asp Ala Ala Arg Leu
        670                 675                 680

GTG GCC GCC CGG GGA CGG CTG ATG CAG GCC CTG CCG GCC GGC GGT GCC      16447
Val Ala Ala Arg Gly Arg Leu Met Gln Ala Leu Pro Ala Gly Gly Ala
    685                 690                 695

ATG GCC GCG CTG CGC GCC ACC GCC GAG GAG ATC GCA CCA CTG CTG GAG      16495
Met Ala Ala Leu Arg Ala Thr Ala Glu Glu Ile Ala Pro Leu Leu Glu
700                 705                 710                 715

CGC CGC GCG GGC GAA CTG GCG CTC GCC GCC GTC AAC GGC CCC TCC TCG      16543
Arg Arg Ala Gly Glu Leu Ala Leu Ala Ala Val Asn Gly Pro Ser Ser
                720                 725                 730

GTG GTG GTG TCG GGC GAC GAG GCC GCC GTC CTG GAG CTA CTG GAG CAG      16591
Val Val Val Ser Gly Asp Glu Ala Ala Val Leu Glu Leu Leu Glu Gln
            735                 740                 745

TGG CGG GCC GAG GGC CGC GAG GCC AGG CGG CTC GCC GTC AGC CAT GCC      16639
Trp Arg Ala Glu Gly Arg Glu Ala Arg Arg Leu Ala Val Ser His Ala
        750                 755                 760

TTC CAT TCA CCG CGG ATG GAC GGA ATG TTG ACA CAG TTC GAC CGG GTC      16687
Phe His Ser Pro Arg Met Asp Gly Met Leu Thr Gln Phe Asp Arg Val
    765                 770                 775

GCT CGC ACC CTG ACG TTC GCT CCG CCG ACC ATT CCC CTC GTG TCC ACC      16735
Ala Arg Thr Leu Thr Phe Ala Pro Pro Thr Ile Pro Leu Val Ser Thr
780                 785                 790                 795

CTC ACC GGT ACG CCC GTC ACC GAG GAA ACC CTG TGC ACC GCG GAC CAC      16783
Leu Thr Gly Thr Pro Val Thr Glu Glu Thr Leu Cys Thr Ala Asp His
                800                 805                 810

TGG GTC CGC CAG GCG CGC GAG CCG GTG CGC TTC CTG GAC GCC ATG CGG      16831
Trp Val Arg Gln Ala Arg Glu Pro Val Arg Phe Leu Asp Ala Met Arg
            815                 820                 825

ACC CTG CGC GCC GAC GGG ATC GAC ACC TTC GTG GAA CTC GGC CCC GAC      16879
Thr Leu Arg Ala Asp Gly Ile Asp Thr Phe Val Glu Leu Gly Pro Asp
        830                 835                 840

GGC GTG CTG TCC GCC ATG GCC CGC GAC TGC GCG GAC GAC CGG CCC GAT      16927
Gly Val Leu Ser Ala Met Ala Arg Asp Cys Ala Asp Asp Arg Pro Asp
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     845                 850                 855

GGC GAC ACA ACC GGG GCC GGG GAC GGG GAG ACC CCC GAT CCG CTG CTC      16975
Gly Asp Thr Thr Gly Ala Gly Asp Gly Glu Thr Pro Asp Pro Leu Leu
860                 865                 870                 875

ACC CTC CCG CTG CTG CGC CGC TCC GTG CCC GAG ACC GGC GAC GCC GAA      17023
Thr Leu Pro Leu Leu Arg Arg Ser Val Pro Glu Thr Gly Asp Ala Glu
                880                 885                 890

CAC CCC GGC GGC TTC GAA CGG GCC CTG GCC ACC GCC TAC GCA CAC GGC      17071
His Pro Gly Gly Phe Glu Arg Ala Leu Ala Thr Ala Tyr Ala His Gly
            895                 900                 905

GTC CCC CTG CGG CTC GCG CCC GCC CCC GAC GCC GCG TCC CTC GCC GTG      17119
Val Pro Leu Arg Leu Ala Pro Ala Pro Asp Ala Ala Ser Leu Ala Val
        910                 915                 920

GCC GCC GAA CTG CCC ACC TAC GCC TTC CAG CGC ACC CAC TAC TGG CTC      17167
Ala Ala Glu Leu Pro Thr Tyr Ala Phe Gln Arg Thr His Tyr Trp Leu
    925                 930                 935

GAC GCG CCC GCC GCC CCC GCC GCC CTC CCC GCC GGG CTC GAC GAC GCC      17215
Asp Ala Pro Ala Ala Pro Ala Ala Leu Pro Ala Gly Leu Asp Asp Ala
940                 945                 950                 955

GGT CAC CCG CTG CTC TCC GCG GCC CTC GAC CTG CCC GGC GGA CGC GGA      17263
Gly His Pro Leu Leu Ser Ala Ala Leu Asp Leu Pro Gly Gly Arg Gly
                960                 965                 970

ACG GTG TGG ACC GGA GCG CTC TCC GCG GCC ACC CTG CCC TGG GCC GCG      17311
Thr Val Trp Thr Gly Ala Leu Ser Ala Ala Thr Leu Pro Trp Ala Ala
            975                 980                 985

GAC CAC AGC GTG CAC GGC CGC ACC GTC CTG CCG GGC ACC GCC CTG CTC      17359
Asp His Ser Val His Gly Arg Thr Val Leu Pro Gly Thr Ala Leu Leu
        990                 995                 1000

GAC CTG GCG CTC CAC GCC GCC CCG CGC GTC GGC GAG TTG ACC TTC GAG      17407
Asp Leu Ala Leu His Ala Ala Pro Arg Val Gly Glu Leu Thr Phe Glu
    1005                1010                1015

GCG CCG CTG GTG CTG CCG GAG GAC GGA GAG GTC CGG CTG CGC GTC GTA      17455
Ala Pro Leu Val Leu Pro Glu Asp Gly Glu Val Arg Leu Arg Val Val
1020                1025                1030                1035

CTC GCT GAA CCG GAC GCG AGC GGA GTA CGC GAA CTG TCT GTC CAC TCC      17503
Leu Ala Glu Pro Asp Ala Ser Gly Val Arg Glu Leu Ser Val His Ser
                1040                1045                1050

GCC GGC GAG GAC GGC GGC TGG ACC CGG CAC GCG ACA GCG GTC CTG GAC      17551
Ala Gly Glu Asp Gly Gly Trp Thr Arg His Ala Thr Ala Val Leu Asp
            1055                1060                1065

ACC GGC ACC ACC ACC GCC GGG GAG CCC GCC GGC GCA CCG CCC GCC GCA      17599
Thr Gly Thr Thr Thr Ala Gly Glu Pro Ala Gly Ala Pro Pro Ala Ala
        1070                1075                1080

TGG CCG CCC GGG GAC GCC GAA CCC CTC GAC CTT GCC GCC GAG TAC GAG      17647
Trp Pro Pro Gly Asp Ala Glu Pro Leu Asp Leu Ala Ala Glu Tyr Glu
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     1085                1090                1095

CGC TTC GCC GAC GCC GGC ATC GGA TAC GGC CCC GCC TTC CGC GGA CTG      17695
Arg Phe Ala Asp Ala Gly Ile Gly Tyr Gly Pro Ala Phe Arg Gly Leu
1100                1105                1110                1115

CGC TCC GCC TGG CGC GAC GGC GAC GCG ATA CTG GCC GAC GTA CGG CTG      17743
Arg Ser Ala Trp Arg Asp Gly Asp Ala Ile Leu Ala Asp Val Arg Leu
                1120                1125                1130

CCC GGC GAA CTG GCC GGC GAA GCC GAC CGG TAC GGC ATC CAC CCG GCC      17791
Pro Gly Glu Leu Ala Gly Glu Ala Asp Arg Tyr Gly Ile His Pro Ala
            1135                1140                1145

CTG CTC GAC GCC GCC CTG CAC ACC GCG GCC GCC GCC CTG GGA GGG GCG      17839
Leu Leu Asp Ala Ala Leu His Thr Ala Ala Ala Ala Leu Gly Gly Ala
        1150                1155                1160

CAC GGG ATG CTG CCG TTC ACG TGG AAC GGC GTC ACC CTC CAC GCC CGC      17887
His Gly Met Leu Pro Phe Thr Trp Asn Gly Val Thr Leu His Ala Arg
    1165                1170                1175

GGA GCG CAC GCC ATC CGG GTG CGG CTG ACC CCG GCC GGC CCC GAC GCG      17935
Gly Ala His Ala Ile Arg Val Arg Leu Thr Pro Ala Gly Pro Asp Ala
1180                1185                1190                1195

GTC GCG GTC ACC GCC GTG GAC CCG GCG GGG CGC CCC GTG TTC ACG GCC      17983
Val Ala Val Thr Ala Val Asp Pro Ala Gly Arg Pro Val Phe Thr Ala
                1200                1205                1210

GCC TCG CTC ACC CTG CGA CCG GTC ACG ACC GGG CAG CTG ACC GCG GCC      18031
Ala Ser Leu Thr Leu Arg Pro Val Thr Thr Gly Gln Leu Thr Ala Ala
            1215                1220                1225

GAG GCC GCG CGG GCC CCG CTG TAC CGG GTG CGC TGG ACC GGC CTC CCG      18079
Glu Ala Ala Arg Ala Pro Leu Tyr Arg Val Arg Trp Thr Gly Leu Pro
        1230                1235                1240

GAC ACC GGA ACC GCC CGG GAC CAC ACC TGG GCG GTG GCC GGC GGC CCG      18127
Asp Thr Gly Thr Ala Arg Asp His Thr Trp Ala Val Ala Gly Gly Pro
    1245                1250                1255

GGC GAC CTG TTA CCC GGG GAG ACC CCG CAC CAC CCC GAC CTC GCC TCC      18175
Gly Asp Leu Leu Pro Gly Glu Thr Pro His His Pro Asp Leu Ala Ser
1260                1265                1270                1275

GCG CTC GCC GAC ACC GGC ACC GCC CCC TTC CGC GTA CTG GCG GAT CTG      18223
Ala Leu Ala Asp Thr Gly Thr Ala Pro Phe Arg Val Leu Ala Asp Leu
                1280                1285                1290

CGC GGA TAC GGC ACC GCC ACC CCC CGG GAA CTC GCC TCC CAG GCG CTC      18271
Arg Gly Tyr Gly Thr Ala Thr Pro Arg Glu Leu Ala Ser Gln Ala Leu
            1295                1300                1305

GCC CTC GTC CAG CAG TGG GCC GAC GCG GCC GAG GCC GCC GAA GGC AGG      18319
Ala Leu Val Gln Gln Trp Ala Asp Ala Ala Glu Ala Ala Glu Gly Arg
        1310                1315                1320

CTC GTC CTG GTG ACA CGC CGG GCC GTC GAC ATC GGT GAC GGC GTC ACG      18367
Leu Val Leu Val Thr Arg Arg Ala Val Asp Ile Gly Asp Gly Val Thr
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     1325                1330                1335

GAC CCG GCG GCG GCG ACC GTG TGG GGA CTG GTC CGG GCG GCA CAG TCC      18415
Asp Pro Ala Ala Ala Thr Val Trp Gly Leu Val Arg Ala Ala Gln Ser
1340                1345                1350                1355

GAG CAC CCC GGG TGC TTC GCG CTC CTC GAC ACC GAC GAC TCC CCC CGC      18463
Glu His Pro Gly Cys Phe Ala Leu Leu Asp Thr Asp Asp Ser Pro Arg
                1360                1365                1370

TCC CGG CAA CTC CTG CCA CGC GTC GCG GGC ACC GCC GAG CAG CTC GCA      18511
Ser Arg Gln Leu Leu Pro Arg Val Ala Gly Thr Ala Glu Gln Leu Ala
            1375                1380                1385

CTC CGC GAC GGC ACC CTG CTC GCC CCC TCC CTC ACC CGT GCC ACG CTG      18559
Leu Arg Asp Gly Thr Leu Leu Ala Pro Ser Leu Thr Arg Ala Thr Leu
        1390                1395                1400

CCC GCC GGC GCC CGG CTG CCC GCA CTC GAC GGC ACC GTC CTG ATC ACT      18607
Pro Ala Gly Ala Arg Leu Pro Ala Leu Asp Gly Thr Val Leu Ile Thr
    1405                1410                1415

GGG GGC ACC GGC AGC CTC GGC GCG GAG GCG GCC CGC CAT CTG GTC ACC      18655
Gly Gly Thr Gly Ser Leu Gly Ala Glu Ala Ala Arg His Leu Val Thr
1420                1425                1430                1435

CGG CAC GGT GCC CGG CGC CTG CTC CTG ACC AGC CGA AGC GGC CCG CAG      18703
Arg His Gly Ala Arg Arg Leu Leu Leu Thr Ser Arg Ser Gly Pro Gln
                1440                1445                1450

GCC CCC GGC GCG GCC GAA CTC GTC GCC GAA CTG GCC GCC TTG GGC GCC      18751
Ala Pro Gly Ala Ala Glu Leu Val Ala Glu Leu Ala Ala Leu Gly Ala
            1455                1460                1465

CAC GCG GAC GTG GCC GCC TGC GAC GTC GCC GAC CGC GCC GCC CTG CGG      18799
His Ala Asp Val Ala Ala Cys Asp Val Ala Asp Arg Ala Ala Leu Arg
        1470                1475                1480

GCC CTG CTC GAC CGC GTA CCC GCC GGC CAC CCG CTG ACC GCG GTC CTG      18847
Ala Leu Leu Asp Arg Val Pro Ala Gly His Pro Leu Thr Ala Val Leu
    1485                1490                1495

CAC ACG GCG GGC GTC CTG GAC GAC GGC GTC CTC ACC GCC CAG ACA CCG      18895
His Thr Ala Gly Val Leu Asp Asp Gly Val Leu Thr Ala Gln Thr Pro
1500                1505                1510                1515

CAG CGG CTC GCG GCC GTC CTC CGC CCG AAG GCC GAC GCC GTA CGC AAT      18943
Gln Arg Leu Ala Ala Val Leu Arg Pro Lys Ala Asp Ala Val Arg Asn
                1520                1525                1530

CTG CAC GAA CTC ACC CAG GGG CAC GCC CTG TCG GCG TTC ATC CTC TAC      18991
Leu His Glu Leu Thr Gln Gly His Ala Leu Ser Ala Phe Ile Leu Tyr
            1535                1540                1545

TCG TCG GCC GCC GGA GTG CTC GGC AGC GCG GGC CAG AGC GGC TAC GCC      19039
Ser Ser Ala Ala Gly Val Leu Gly Ser Ala Gly Gln Ser Gly Tyr Ala
        1550                1555                1560

GCC GCC AAC GCC TAC CTG GAC TCC TTC GCC GTC TGG CGG CGG AGC CGG      19087
Ala Ala Asn Ala Tyr Leu Asp Ser Phe Ala Val Trp Arg Arg Ser Arg
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     1565                1570                1575

GGA CTG CCC GCC GTA TCG CTC GGC TGG GGC CCG TGG GAC GGC GGC GGC      19135
Gly Leu Pro Ala Val Ser Leu Gly Trp Gly Pro Trp Asp Gly Gly Gly
1580                1585                1590                1595

ATG GCG AGC GGA CTC GGC GGA ACC GAC ACG GCC CGG CTG CGG CGC AGC      19183
Met Ala Ser Gly Leu Gly Gly Thr Asp Thr Ala Arg Leu Arg Arg Ser
                1600                1605                1610

GGC ATC GCA CCC CTC AGC CGC GCC GAG GGC CTG GCC GCG CTC GAC GCG      19231
Gly Ile Ala Pro Leu Ser Arg Ala Glu Gly Leu Ala Ala Leu Asp Ala
            1615                1620                1625

GCG CTC GCG GCC GGC GGC GAC GAC ACC GCG CCG GCC CAC CTG CTG CCG      19279
Ala Leu Ala Ala Gly Gly Asp Asp Thr Ala Pro Ala His Leu Leu Pro
        1630                1635                1640

ATC CGC GTC GAC GCG GTG ACC CTG CGC GGC GCC GAC ACC GTC CCC GCC      19327
Ile Arg Val Asp Ala Val Thr Leu Arg Gly Ala Asp Thr Val Pro Ala
    1645                1650                1655

GTG CTG CGC GAC CTG GCG GGA ACC GCG CCA AGC GCC GCC GAA CGG CCC      19375
Val Leu Arg Asp Leu Ala Gly Thr Ala Pro Ser Ala Ala Glu Arg Pro
1660                1665                1670                1675

CCC GGG ACA CCG GAG GAC ACG AAC GCG CCC CTG GCG GAC GTC ACC CAA      19423
Pro Gly Thr Pro Glu Asp Thr Asn Ala Pro Leu Ala Asp Val Thr Gln
                1680                1685                1690

CTG CAC GGC CGG GAA CGG AAG GAG GCA CTG ACC GGC TTC GTA CGC GCC      19471
Leu His Gly Arg Glu Arg Lys Glu Ala Leu Thr Gly Phe Val Arg Ala
            1695                1700                1705

CAG GTG GCC GCG GTG CTC GGC CAC CCC ACG TCC GAC ACG ATC GAC GTC      19519
Gln Val Ala Ala Val Leu Gly His Pro Thr Ser Asp Thr Ile Asp Val
        1710                1715                1720

CGC CGG AGC TTC AAG GAA GCG GGC TTC GAC TCC CTC ACC GCC GTC GAA      19567
Arg Arg Ser Phe Lys Glu Ala Gly Phe Asp Ser Leu Thr Ala Val Glu
    1725                1730                1735

CTG CGC AAC CGG CTG CGC GCC GCC ACC GGG CTG AAG CTG CCC GCC ACG      19615
Leu Arg Asn Arg Leu Arg Ala Ala Thr Gly Leu Lys Leu Pro Ala Thr
1740                1745                1750                1755

CTG GTG TTC GAC CAC CCG ACC CCC CTC GCG CTC GCC GGC TTC CTC CAC      19663
Leu Val Phe Asp His Pro Thr Pro Leu Ala Leu Ala Gly Phe Leu His
                1760                1765                1770

CGC GAA CTC CCC GGC GCC GAA GCC TCC CTG ATG AGC GCG ATC GAC ACT      19711
Arg Glu Leu Pro Gly Ala Glu Ala Ser Leu Met Ser Ala Ile Asp Thr
            1775                1780                1785

CTC CGG CAC CGG CTG CGC GAC GCC CTG GCC GAC GAC GCC GCA GAC GAC      19759
Leu Arg His Arg Leu Arg Asp Ala Leu Ala Asp Asp Ala Ala Asp Asp
        1790                1795                1800

GCC CTG CGC GAC CAG ATC ACC CGA CGA CTC GAG ACC CTG CTG GCC GGC      19807
Ala Leu Arg Asp Gln Ile Thr Arg Arg Leu Glu Thr Leu Leu Ala Gly
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     1805                1810                1815

ATA GCC CGG ACC GAG GAG CCC GCG CCC GCC ACC GCC GCC GCC GAC GAC      19855
Ile Ala Arg Thr Glu Glu Pro Ala Pro Ala Thr Ala Ala Ala Asp Asp
1820                1825                1830                1835

GGG AGC GGA GCC GGT GAT GTC GCG GAA CGA CTG AGC ACC GCG TCG GAC      19903
Gly Ser Gly Ala Gly Asp Val Ala Glu Arg Leu Ser Thr Ala Ser Asp
                1840                1845                1850

GAC GAA CTG TTC GAA CTG CTC GAC AGC GGT TTC ACA CCC TGA CCGGCCGGCG   19955
Asp Glu Leu Phe Glu Leu Leu Asp Ser Gly Phe Thr Pro *
            1855                1860                1865

GACCGGCACC ACGACATCGA GGCGACCGCA CCGAACACCC CCAGGGGGAA AGCT          20009

GTG TCC ACC GAG AAC TCC ACC AAC GTC CCG GCG AGC GAG                   20048
Met Ser Thr Glu Asn Ser Thr Asn Val Pro Ala Ser Glu
1               5                   10

GAC AAG CTC CGC GCC TAT CTG CGT CGC GCG ATG GCC GAC CTC CAC GAG      20096
Asp Lys Leu Arg Ala Tyr Leu Arg Arg Ala Met Ala Asp Leu His Glu
    15                  20                  25

TCC CGC GAA CGG CTC CGC GCC ACG GAA GCG CGC GCC CAG GAG CCG ATC      20144
Ser Arg Glu Arg Leu Arg Ala Thr Glu Ala Arg Ala Gln Glu Pro Ile
30                  35                  40                  45

GCG GTG GTG GGT ATG GGG TGC CGG TTC CCC GGT GGG GTG GGT TCG CCG      20192
Ala Val Val Gly Met Gly Cys Arg Phe Pro Gly Gly Val Gly Ser Pro
                50                  55                  60

GAG GCG TTG TGG CGG TTG GTG GTG GAG GGG GTG GAC GCG GTT TCC CCG      20240
Glu Ala Leu Trp Arg Leu Val Val Glu Gly Val Asp Ala Val Ser Pro
            65                  70                  75

TTT CCC GGT GAT CGT GGC TGG GAT GTG GAG GGG TTG TAC GAC CCG GAG      20288
Phe Pro Gly Asp Arg Gly Trp Asp Val Glu Gly Leu Tyr Asp Pro Glu
        80                  85                  90

CCG GGT GTG GCG GGG AAG TCG TAT GTG CGG GAG GGG GGT TTT CTG CAT      20336
Pro Gly Val Ala Gly Lys Ser Tyr Val Arg Glu Gly Gly Phe Leu His
    95                  100                 105

GAT GCG GCG GAG TTC GAT GCG GAG TTC TTC GGG ATT TCG CCG CGT GAG      20384
Asp Ala Ala Glu Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg Glu
110                 115                 120                 125

GCG GTG GCG ATG GAT CCG CAG CAG CGG CTG TTG CTG GAG ACC TCC TGG      20432
Ala Val Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser Trp
                130                 135                 140

GAG GCG ATC GAG CGG GCG GGT ATC GAC CCG CAT TCG CTG CAC GGC AGC      20480
Glu Ala Ile Glu Arg Ala Gly Ile Asp Pro His Ser Leu His Gly Ser
            145                 150                 155

CGC ACC GGC GTC TAC GCC GGC GTG ATG TAC CAC GAC TAT GGC ACG GGA      20528
Arg Thr Gly Val Tyr Ala Gly Val Met Tyr His Asp Tyr Gly Thr Gly
        160                 165                 170
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CAG ACC TCC GCG ACC GAC ACG AGC GGT TAT TCC GGC ACC GGT ACG TCG      20576
Gln Thr Ser Ala Thr Asp Thr Ser Gly Tyr Ser Gly Thr Gly Thr Ser
    175                 180                 185

GGG AGT GTG GTG TCG GGG CGT GTG GCC TAC ACG CTG GGG CTG GAG GGT      20624
Gly Ser Val Val Ser Gly Arg Val Ala Tyr Thr Leu Gly Leu Glu Gly
190                 195                 200                 205

CCG GCC GTG ACC GTG GAT ACG GCG TGT TCG TCG TCG TTG GTG GCG TTG      20672
Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu
                210                 215                 220

CAT CTG GCG GTG CAG GCG TTG CGG GGT GGC GAG TGT GAC ATG GCG TTG      20720
His Leu Ala Val Gln Ala Leu Arg Gly Gly Glu Cys Asp Met Ala Leu
            225                 230                 235

GCC GGT GGT GTG ACG GTG ATG GCC GGG CCG GGG ATG TTC GTG GAG TTT      20768
Ala Gly Gly Val Thr Val Met Ala Gly Pro Gly Met Phe Val Glu Phe
        240                 245                 250

TCG CGG CAG CGG GGG TTG GCG GCC GAT GGG CGG TGC AAG GCG TTC GCG      20816
Ser Arg Gln Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys Ala Phe Ala
    255                 260                 265

GAT GGG GCG GAT GGG ACC GCT TGG GCC GAG GGT GCG GGG GTG GTG CTG      20864
Asp Gly Ala Asp Gly Thr Ala Trp Ala Glu Gly Ala Gly Val Val Leu
270                 275                 280                 285

GTG GAG CGG TTG TCG GAT GCC CGG CGG TTG GGG CAT CCG GTG TTG GCG      20912
Val Glu Arg Leu Ser Asp Ala Arg Arg Leu Gly His Pro Val Leu Ala
                290                 295                 300

GTG GTG TGT GGG TCG GCG GTG AAT CAG GAC GGT GCG TCG AAT GGT TTG      20960
Val Val Cys Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu
            305                 310                 315

ACG GCG CCG AGT GGT CCG TCG CAG GAG CGG GTG ATT CGT CAG GCG TTG      21008
Thr Ala Pro Ser Gly Pro Ser Gln Glu Arg Val Ile Arg Gln Ala Leu
        320                 325                 330

GCG AAT GCG CGG TTG ACG GTG GCG GAT GTG GAT GTG GTG GAG GCG CAT      21056
Ala Asn Ala Arg Leu Thr Val Ala Asp Val Asp Val Val Glu Ala His
    335                 340                 345

GGG ACG GGG ACG CGG CTG GGT GAT CCG ATC GAG GCG CAG GCG TTG CTG      21104
Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu
350                 355                 360                 365

GGG ACG TAT GGG CGG GAT CGT GAT GGT GGG CGT CCG GTG TGG TTG GGG      21152
Gly Thr Tyr Gly Arg Asp Arg Asp Gly Gly Arg Pro Val Trp Leu Gly
                370                 375                 380

TCG TTG AAG TCG AAT ATT GGT CAT GCT CAG GCG GCT GCG GGG GTG GCT      21200
Ser Leu Lys Ser Asn Ile Gly His Ala Gln Ala Ala Ala Gly Val Ala
            385                 390                 395

GGT GTG ATC AAG ATG GTG TTG GCG ATG CGG TAT GGG TGG TTG CCG CGG      21248
Gly Val Ile Lys Met Val Leu Ala Met Arg Tyr Gly Trp Leu Pro Arg
        400                 405                 410
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ACG TTG CAT GTG GAT GAG CCG AGC CGG CAT GTG GAC TGG TCG GCT GGT      21296
Thr Leu His Val Asp Glu Pro Ser Arg His Val Asp Trp Ser Ala Gly
    415                 420                 425

GGT GTG TGG TTG CTG ACC GAG GCG CGG GAG TGG CCG GGG GTG GAC CGG      21344
Gly Val Trp Leu Leu Thr Glu Ala Arg Glu Trp Pro Gly Val Asp Arg
430                 435                 440                 445

CCG CGT CGG GCG GCG GTC TCC GCC TTT GGT GTC AGT GGT ACC AAC GCC      21392
Pro Arg Arg Ala Ala Val Ser Ala Phe Gly Val Ser Gly Thr Asn Ala
                450                 455                 460

CAT CTG ATC CTC GAA GCC CCC GAC ACC GCC GAG GCG GAG AGC GCC ACG      21440
His Leu Ile Leu Glu Ala Pro Asp Thr Ala Glu Ala Glu Ser Ala Thr
            465                 470                 475

ACC CCG GTC CGC TCT GAG GTG TCG GAG TCT GCT GCG GTC TTC GAT GCC      21488
Thr Pro Val Arg Ser Glu Val Ser Glu Ser Ala Ala Val Phe Asp Ala
        480                 485                 490

CGC AGT GGT GTG GTG CCG GTG GTG GTT TCG GGG CGT TCG CGG GTG GTG      21536
Arg Ser Gly Val Val Pro Val Val Val Ser Gly Arg Ser Arg Val Val
    495                 500                 505

GTG CGG GAG GCT GCG GGC CGG TTG GCG GAG GTG GTG GAG GCC GGT GGT      21584
Val Arg Glu Ala Ala Gly Arg Leu Ala Glu Val Val Glu Ala Gly Gly
510                 515                 520                 525

GTG GGG CTG GCG GAT GTG GCG GTG ACG ATG GCG GGC CGG TCG CGG TTT      21632
Val Gly Leu Ala Asp Val Ala Val Thr Met Ala Gly Arg Ser Arg Phe
                530                 535                 540

GGG TAT CGG GCG GTT GTG CTG GCT CGG GGT GAG GCT GAG CTT GCC GGG      21680
Gly Tyr Arg Ala Val Val Leu Ala Arg Gly Glu Ala Glu Leu Ala Gly
            545                 550                 555

CGT TTG CGG GCG TTG GCG GGG GGT GAT CCG GAC GCG GGT GTG GTC ACG      21728
Arg Leu Arg Ala Leu Ala Gly Gly Asp Pro Asp Ala Gly Val Val Thr
        560                 565                 570

GGT GCG GTG GTG GAC CCG GAG ACG GGG TCC GGT GGT GGG GGG GTG GTG      21776
Gly Ala Val Val Asp Pro Glu Thr Gly Ser Gly Gly Gly Gly Val Val
    575                 580                 585

TTG GTT TTC CCT GGT CAG GGG ACG CAG TGG GTG GGG ATG GGT GCG GGG      21824
Leu Val Phe Pro Gly Gln Gly Thr Gln Trp Val Gly Met Gly Ala Gly
590                 595                 600                 605

CTG CTG GGG TCT TCG GAG GTG TTT GCG GCG TCG ATG CGG GAG TGT GCG      21872
Leu Leu Gly Ser Ser Glu Val Phe Ala Ala Ser Met Arg Glu Cys Ala
                610                 615                 620

CGG GCG CTG AGT GTT CAT GTG GGG TGG GAT TTG CTG GAG GTG GTG TCG      21920
Arg Ala Leu Ser Val His Val Gly Trp Asp Leu Leu Glu Val Val Ser
            625                 630                 635

GGC GGG GCC GGG TTG GAG CGG GTG GAT GTG GTG CAG CCG GTG ACG TGG      21968
Gly Gly Ala Gly Leu Glu Arg Val Asp Val Val Gln Pro Val Thr Trp
        640                 645                 650
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GCG GTG ATG GTG TCG CTG GCC CGG TAC TGG CAG GCG ATG GGT GTG GAC      22016
Ala Val Met Val Ser Leu Ala Arg Tyr Trp Gln Ala Met Gly Val Asp
    655                 660                 665

GTG GCT GCG GTG GTG GGT CAT TCC CAG GGG GAG ATC GCT GCT GCC ACG      22064
Val Ala Ala Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Ala Thr
670                 675                 680                 685

GTG GCG GGG GCG TTG TCG CTG GAG GAT GCG GCG GCT GTG GTC GCT CTG      22112
Val Ala Gly Ala Leu Ser Leu Glu Asp Ala Ala Ala Val Val Ala Leu
                690                 695                 700

CGG GCG GGG TTG ATT GGC CGG TAT CTG GCG GGT CGT GGT GCG ATG GCG      22160
Arg Ala Gly Leu Ile Gly Arg Tyr Leu Ala Gly Arg Gly Ala Met Ala
            705                 710                 715

GCT GTT CCG CTG CCT GCC GGC GAG GTC GAG GCC GGG CTG GCG AAG TGG      22208
Ala Val Pro Leu Pro Ala Gly Glu Val Glu Ala Gly Leu Ala Lys Trp
        720                 725                 730

CCG GGT GTG GAG GTC GCG GCG GTC AAC GGT CCG GCG TCT ACG GTG GTT      22256
Pro Gly Val Glu Val Ala Ala Val Asn Gly Pro Ala Ser Thr Val Val
    735                 740                 745

TCC GGG GAT CGG CGG GCG GTG GCC GGT TAT GTG GCC GTC TGT CAG GCG      22304
Ser Gly Asp Arg Arg Ala Val Ala Gly Tyr Val Ala Val Cys Gln Ala
750                 755                 760                 765

GAG GGT GTG CAG GCT CGG TTG ATA CCG GTG GAC TAC GCC TCT CAC TCC      22352
Glu Gly Val Gln Ala Arg Leu Ile Pro Val Asp Tyr Ala Ser His Ser
                770                 775                 780

CGC CAT GTG GAG GAC CTG AAG GGC GAG TTG GAG CGG GTG CTG TCC GGT      22400
Arg His Val Glu Asp Leu Lys Gly Glu Leu Glu Arg Val Leu Ser Gly
            785                 790                 795

ATC CGC CCG CGC AGT CCG CGG GTG CCG GTG TGT TCC ACC GTC GCC GGA      22448
Ile Arg Pro Arg Ser Pro Arg Val Pro Val Cys Ser Thr Val Ala Gly
        800                 805                 810

GAG CAG CCG GGC GAG CCG GTT TTC GAT GCG GGG TAT TGG TTC CGT AAT      22496
Glu Gln Pro Gly Glu Pro Val Phe Asp Ala Gly Tyr Trp Phe Arg Asn
    815                 820                 825

CTG CGG AAC CGG GTT GAG TTC TCC GCG GTG GTC GGT GGT TTG TTG GAG      22544
Leu Arg Asn Arg Val Glu Phe Ser Ala Val Val Gly Gly Leu Leu Glu
830                 835                 840                 845

GAG GGC CAC CGT CGG TTC ATC GAG GTC AGT GCC CAC CCG GTA CTC GTT      22592
Glu Gly His Arg Arg Phe Ile Glu Val Ser Ala His Pro Val Leu Val
                850                 855                 860

CAT GCC ATT GAG CAG ACG GCC GAG GCC GCG GAC CGG AGT GTC CAT GCC      22640
His Ala Ile Glu Gln Thr Ala Glu Ala Ala Asp Arg Ser Val His Ala
            865                 870                 875

ACC GGG ACC CTG CGC CGC CAG GAC GAC AGC CCG CAC CGC CTG CTG ACC      22688
Thr Gly Thr Leu Arg Arg Gln Asp Asp Ser Pro His Arg Leu Leu Thr
        880                 885                 890
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TCC ACC GCC GAG GCC TGG GCC CAC GGC GCC ACC CTC ACC TGG GAC CCC      22736
Ser Thr Ala Glu Ala Trp Ala His Gly Ala Thr Leu Thr Trp Asp Pro
    895                 900                 905

GCC CTG CCC CCA GGC CAC CTC ACC ACC CTC CCC ACC TAC CCC TTC AAC      22784
Ala Leu Pro Pro Gly His Leu Thr Thr Leu Pro Thr Tyr Pro Phe Asn
910                 915                 920                 925

CAC CAC CAC TAC TGG CTC GAC ACC ACC CCC ACC ACC CCC GCG ACG ACC      22832
His His His Tyr Trp Leu Asp Thr Thr Pro Thr Thr Pro Ala Thr Thr
                930                 935                 940

ACC CAG AGC CCC ACC GAT GCC CAG AAC CCC GCC GAC GCC CTT CCC TAC      22880
Thr Gln Ser Pro Thr Asp Ala Gln Asn Pro Ala Asp Ala Leu Pro Tyr
            945                 950                 955

AAG GTG AGT TGG AAG CGG TTG CGG GAC CAG GAC AGC TTG ACC GCG CGC      22928
Lys Val Ser Trp Lys Arg Leu Arg Asp Gln Asp Ser Leu Thr Ala Arg
        960                 965                 970

CTC GAC GGC CGA TGG CTG CTG GTG GTA CCG GAG GCG TCG GCG GAC CCG      22976
Leu Asp Gly Arg Trp Leu Leu Val Val Pro Glu Ala Ser Ala Asp Pro
    975                 980                 985

TCG GTT GCT GAG GGC GTC GCG CGC GAG CTG ACC GCG CGG GGC GCG ACC      23024
Ser Val Ala Glu Gly Val Ala Arg Glu Leu Thr Ala Arg Gly Ala Thr
990                 995                 1000                1005

GTG GAG TCG CTG ACG GTC GAG CCG GGC GCC GAC CGT TCG CGG CTG CGC      23072
Val Glu Ser Leu Thr Val Glu Pro Gly Ala Asp Arg Ser Arg Leu Arg
                1010                1015                1020

GGG CTG CTG GTC GAC GCC ACG GAA CGG GAC GAA GCC GGG CCG CTG CGC      23120
Gly Leu Leu Val Asp Ala Thr Glu Arg Asp Glu Ala Gly Pro Leu Arg
            1025                1030                1035

GGG ATC GTC TCG CTG CTG GCG TTG GCC GGG GAC CAC GCC GGG GCC GAC      23168
Gly Ile Val Ser Leu Leu Ala Leu Ala Gly Asp His Ala Gly Ala Asp
        1040                1045                1050

GGG GCA CGC CCG GTG GTT CCG GCC GGC CTG GCA GCG TCA CTG GCG CTG      23216
Gly Ala Arg Pro Val Val Pro Ala Gly Leu Ala Ala Ser Leu Ala Leu
    1055                1060                1065

ATC CAG GCC GCG GGC GAC GCG GGC ACG GAG GCC GGG CTG TGG GCG GTG      23264
Ile Gln Ala Ala Gly Asp Ala Gly Thr Glu Ala Gly Leu Trp Ala Val
1070                1075                1080                1085

ACC CGC GGC GCC GTC GCG GCC GTG CCC GGT GAC GTA CCG GCG CCG TCG      23312
Thr Arg Gly Ala Val Ala Ala Val Pro Gly Asp Val Pro Ala Pro Ser
                1090                1095                1100

CAG GCG CTG CTC TGG GGA TTC GGC CGG GTG GCC GGG ATC GAG CTG CCG      23360
Gln Ala Leu Leu Trp Gly Phe Gly Arg Val Ala Gly Ile Glu Leu Pro
            1105                1110                1115

CAC TGC TGG GGC GGC CTG CTC GAC CTG CCG ACC GGG CCC GGC GAC TCC      23408
His Cys Trp Gly Gly Leu Leu Asp Leu Pro Thr Gly Pro Gly Asp Ser
        1120                1125                1130
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GGG TTC CGG CAA CTG GCC GCG ACC CTG GCG GGC CGT CCC GCG GAG GAC      23456
Gly Phe Arg Gln Leu Ala Ala Thr Leu Ala Gly Arg Pro Ala Glu Asp
    1135                1140                1145

CAG GTG GCG CTG CGG GCT TCG GGC GCG TAC GGC CGC AGG CTG GTC CGG      23504
Gln Val Ala Leu Arg Ala Ser Gly Ala Tyr Gly Arg Arg Leu Val Arg
1150                1155                1160                1165

GCC TCC GCG GCG GGC GGC GCG GAC GGC TGG CGG CCG CGG GGA ACG GTG      23552
Ala Ser Ala Ala Gly Gly Ala Asp Gly Trp Arg Pro Arg Gly Thr Val
                1170                1175                1180

CTG GTG GTG GGC GAC ACC GCG GAG GTC GCC GGA CCG CTG GTG CGC TGG      23600
Leu Val Val Gly Asp Thr Ala Glu Val Ala Gly Pro Leu Val Arg Trp
            1185                1190                1195

CTG CTC GGC AAC GGC GCA CGG CGG GTG ACC CTG TCC GGA CTC TCC GGC      23648
Leu Leu Gly Asn Gly Ala Arg Arg Val Thr Leu Ser Gly Leu Ser Gly
        1200                1205                1210

CCG CTG CCG GAG GAA CTC GCC GAT GTG GCG GCA CGG GTG ACC GTG GCG      23696
Pro Leu Pro Glu Glu Leu Ala Asp Val Ala Ala Arg Val Thr Val Ala
    1215                1220                1225

CCC TGT GAT CCG GCC GAT CGC CCC GCC CTG CGG ACG CTG CTC GCC GAA      23744
Pro Cys Asp Pro Ala Asp Arg Pro Ala Leu Arg Thr Leu Leu Ala Glu
1230                1235                1240                1245

CAG GCG CCG ACC GCC GTG CTC GTG GCG CCC CCG GCC GTC CCG CCC ACG      23792
Gln Ala Pro Thr Ala Val Leu Val Ala Pro Pro Ala Val Pro Pro Thr
                1250                1255                1260

CCG CTC GCG GAG ATG ACC GCC GAG GCG TTA GCC ATC GCG CTG TCC GCG      23840
Pro Leu Ala Glu Met Thr Ala Glu Ala Leu Ala Ile Ala Leu Ser Ala
            1265                1270                1275

AAG ACC GGT CTG GTC GAC CGT CTG GAC TCG CTG CTC GAC GAG CCG GAC      23888
Lys Thr Gly Leu Val Asp Arg Leu Asp Ser Leu Leu Asp Glu Pro Asp
        1280                1285                1290

CCC CTG CTC GAG GAC GGG GAA CTC GAC GCG TTC GTC GTC TTC TCC TCC      23936
Pro Leu Leu Glu Asp Gly Glu Leu Asp Ala Phe Val Val Phe Ser Ser
    1295                1300                1305

GTG GCA GGG GTG TGG GGC GGC GCG GGA CAG GGT GGT TAC GCG GCC GGT      23984
Val Ala Gly Val Trp Gly Gly Ala Gly Gln Gly Gly Tyr Ala Ala Gly
1310                1315                1320                1325

ACC GCG TAC CTC GAC GCG CTC GCC GAA TGC CGG CGG GCC GGG GGG CTG      24032
Thr Ala Tyr Leu Asp Ala Leu Ala Glu Cys Arg Arg Ala Gly Gly Leu
                1330                1335                1340

CCG GTC ACC TCG GTG GCG TGG ACG CCG TGG CTC GGT ACG CCG GCG GCG      24080
Pro Val Thr Ser Val Ala Trp Thr Pro Trp Leu Gly Thr Pro Ala Ala
            1345                1350                1355

GAC TCC CTG GGC GAG CAG ATG AGC CGA GCT GGC ATC ACC CCC CTG GAT      24128
Asp Ser Leu Gly Glu Gln Met Ser Arg Ala Gly Ile Thr Pro Leu Asp
        1360                1365                1370
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CCG GCG GCC TCG CTG GAT GCG CTC GCC CGT GCG GTG GGC CGG CGC GCG      24176
Pro Ala Ala Ser Leu Asp Ala Leu Ala Arg Ala Val Gly Arg Arg Ala
    1375                1380                1385

GGC TGT GTG ACG GTC GCC GAC ATC GAC TGG GAG CGG TTC GCC TCC GCG      24224
Gly Cys Val Thr Val Ala Asp Ile Asp Trp Glu Arg Phe Ala Ser Ala
1390                1395                1400                1405

TAC ACG GCC ACC CGT CCC ACG CCG ATG TTC GAC GAG GTG CCC GAG GTG      24272
Tyr Thr Ala Thr Arg Pro Thr Pro Met Phe Asp Glu Val Pro Glu Val
                1410                1415                1420

CGG CGG ATA CAG GCC GCG TGG GCG GAA GCG GAG GCC GAC GCC GCG CGC      24320
Arg Arg Ile Gln Ala Ala Trp Ala Glu Ala Glu Ala Asp Ala Ala Arg
            1425                1430                1435

AGC GGT GCC GGC GGC GAC TCG CAG CTG CTG CGC TCC CTC CGG GGC CGG      24368
Ser Gly Ala Gly Gly Asp Ser Gln Leu Leu Arg Ser Leu Arg Gly Arg
        1440                1445                1450

CCC GAG GAG GCC CAA CTG GCG GAG CTG CTG CGG CTG GTG CGC ACC CAT      24416
Pro Glu Glu Ala Gln Leu Ala Glu Leu Leu Arg Leu Val Arg Thr His
    1455                1460                1465

GCC GCC GCG GTG CTC GGC CTG GGC TCG CCC GGC GCG GTG GAG GCG CGG      24464
Ala Ala Ala Val Leu Gly Leu Gly Ser Pro Gly Ala Val Glu Ala Arg
1470                1475                1480                1485

CGT TCG TTC AAG GAC CTG GGC TTC AAC TCG GTG ACG GCG GTG GAG CTG      24512
Arg Ser Phe Lys Asp Leu Gly Phe Asn Ser Val Thr Ala Val Glu Leu
                1490                1495                1500

CGG AAC CGG CTG AAG GAG GCG ACG GGA CTC CGG CTG GAG GTG TCC CTG      24560
Arg Asn Arg Leu Lys Glu Ala Thr Gly Leu Arg Leu Glu Val Ser Leu
            1505                1510                1515

GTC TTC GAC CAC CCG GAC CCG GCC TCC CTC GCC CGG CAT CTG CTG GAT      24608
Val Phe Asp His Pro Asp Pro Ala Ser Leu Ala Arg His Leu Leu Asp
        1520                1525                1530

CTC GCC CTC GGC CAG GAG CCG GAG GAG ACG CCG CGG GCG TTC GCG CTC      24656
Leu Ala Leu Gly Gln Glu Pro Glu Glu Thr Pro Arg Ala Phe Ala Leu
    1535                1540                1545

GAA CCC GCG CCG AAC GGG GAG CCG ATC GCG ATC GTG TCC ATG GCC TGC      24704
Glu Pro Ala Pro Asn Gly Glu Pro Ile Ala Ile Val Ser Met Ala Cys
1550                1555                1560                1565

CGT ATG CCG GGG GGT GTC AGC ACG CCC GAG GAG CTG TGG CGG CTG CTG      24752
Arg Met Pro Gly Gly Val Ser Thr Pro Glu Glu Leu Trp Arg Leu Leu
                1570                1575                1580

CGG GAC GGC AAG GAC GCG ATC GGG CCG TTC CCC GCC AAC CGG GGC TGG      24800
Arg Asp Gly Lys Asp Ala Ile Gly Pro Phe Pro Ala Asn Arg Gly Trp
            1585                1590                1595

GAC CTG GAG AAC CTC TAC GAC CCC GAC CCG GAC GCC GAC GGC CGC ACC      24848
Asp Leu Glu Asn Leu Tyr Asp Pro Asp Pro Asp Ala Asp Gly Arg Thr
        1600                1605                1610
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TAT GTG CGC GAG GGC GGA TTC CTC CAC GAG GCA CCG GAC TTC GAC CCC      24896
Tyr Val Arg Glu Gly Gly Phe Leu His Glu Ala Pro Asp Phe Asp Pro
    1615                1620                1625

TCG TTC TTC GGC ATC TCG CCG CGC GAG GCG CTG GCG ATG GAC CCG CAG      24944
Ser Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln
1630                1635                1640                1645

CAG CGG CTG CTG CTG GAG ACT TCC TGG GAG GCC TTG GAG CGC GCC GGC      24992
Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly
                1650                1655                1660

ATC GAC CCG GCG AGG CTG CGC GGC AGC CGT ACC GGC GTC TTC GTC GGG      25040
Ile Asp Pro Ala Arg Leu Arg Gly Ser Arg Thr Gly Val Phe Val Gly
            1665                1670                1675

ACG AAC GGC CAG CAC TAC ATG CCG CTG CTC CAG AAC GGC GGG GAC AGC      25088
Thr Asn Gly Gln His Tyr Met Pro Leu Leu Gln Asn Gly Gly Asp Ser
        1680                1685                1690

TTC GAC GGC TAT CTG GGC ACC GGC AAC TCG GCG AGT GTG ATG TCG GGC      25136
Phe Asp Gly Tyr Leu Gly Thr Gly Asn Ser Ala Ser Val Met Ser Gly
    1695                1700                1705

CGG CTG TCG TAC GTG TTC GGC CTC GAA GGC CCC GCC GTG ACC GTG GAC      25184
Arg Leu Ser Tyr Val Phe Gly Leu Glu Gly Pro Ala Val Thr Val Asp
1710                1715                1720                1725

ACC GCC TGC TCG GCG TCC CTG GTG GCG CTG CAC CTG GCG GTG CAG GCG      25232
Thr Ala Cys Ser Ala Ser Leu Val Ala Leu His Leu Ala Val Gln Ala
                1730                1735                1740

ATG CGG CGC GGC GAG TGC GAC ATG GCG CTG GTC GGC GGC GCG ACG GTG      25280
Met Arg Arg Gly Glu Cys Asp Met Ala Leu Val Gly Gly Ala Thr Val
            1745                1750                1755

ATG TCG ACG CCC GAG ATG CTG GTG GAG TTC TCC CGG CAG CGG GTG ATC      25328
Met Ser Thr Pro Glu Met Leu Val Glu Phe Ser Arg Gln Arg Val Ile
        1760                1765                1770

TCC GCC AAC GGC CGG TCG AGG GCC TTC GCC GCC GGT GCC GAC GGT GTG      25376
Ser Ala Asn Gly Arg Ser Arg Ala Phe Ala Ala Gly Ala Asp Gly Val
    1775                1780                1785

GCG CTC GGC GAG GGC GTG GGC GTC CTG CTG GTG GAG CGG CTG TCG GAC      25424
Ala Leu Gly Glu Gly Val Gly Val Leu Leu Val Glu Arg Leu Ser Asp
1790                1795                1800                1805

GCC GAG CGC AAC GGC CAT CCG GTG CTG GCG GTG GTC CGC GGC TCG GCG      25472
Ala Glu Arg Asn Gly His Pro Val Leu Ala Val Val Arg Gly Ser Ala
                1810                1815                1820

GTC AAC CAG GAC GGC GCC TCC AAC GGG CTG ACG GCG CCC AAC GGG CCC      25520
Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro
            1825                1830                1835

TCC CAG CAG CGG GTG ATC CGG CAG GCG CTG GCG GAC GCC GGG CTG CGG      25568
Ser Gln Gln Arg Val Ile Arg Gln Ala Leu Ala Asp Ala Gly Leu Arg
        1840                1845                1850
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CCC GAG GAC ATC GAC GCC GTC GAG GCG CAC GGC ACC GGC ACC GAG CTG      25616
Pro Glu Asp Ile Asp Ala Val Glu Ala His Gly Thr Gly Thr Glu Leu
    1855                1860                1865

GGC GAC CCC ATC GAG GCC GAG GCG CTG CTC GCC ACC TAT GGA AGG ACC      25664
Gly Asp Pro Ile Glu Ala Glu Ala Leu Leu Ala Thr Tyr Gly Arg Thr
1870                1875                1880                1885

CGT ACG GCG GAC CGC CCG CTG TGG CTC GGC TCC CTG AAG TCC AAC ATC      25712
Arg Thr Ala Asp Arg Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Ile
                1890                1895                1900

GGG CAC ACC CAG GCC GCC GCC GGC GTG GCG GGC GTC ATC AAG ATG GTG      25760
Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys Met Val
            1905                1910                1915

CTC GCG CTG GGC AAC GAG ACA CTG CCG CGC ACC CTG CAC GTG GAT GAG      25808
Leu Ala Leu Gly Asn Glu Thr Leu Pro Arg Thr Leu His Val Asp Glu
        1920                1925                1930

CCC ACA CCG CGC GTG GAC TGG TCC TCT GGC GCG GTC TCC CTG CTC ACC      25856
Pro Thr Pro Arg Val Asp Trp Ser Ser Gly Ala Val Ser Leu Leu Thr
    1935                1940                1945

GAG CCG GTG GAC TGG CCC GCC GGC CCG TCC GCG CCG CGC CGT GCG GCC      25904
Glu Pro Val Asp Trp Pro Ala Gly Pro Ser Ala Pro Arg Arg Ala Ala
1950                1955                1960                1965

GTG TCC TCG TTC GGC ATC AGC GGC ACC AAC GCC CAC ACG ATC CTG GAG      25952
Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Thr Ile Leu Glu
                1970                1975                1980

CAG GCC CCC GTC CCC GCG GAG TCC CGC CCC GGG ACG GAG CCG GCG GAC      26000
Gln Ala Pro Val Pro Ala Glu Ser Arg Pro Gly Thr Glu Pro Ala Asp
            1985                1990                1995

GGC ACG GGC GCG TGG GAG AAC GTG ACC GTT CCG CTG CTG CTG TCC GGC      26048
Gly Thr Gly Ala Trp Glu Asn Val Thr Val Pro Leu Leu Leu Ser Gly
        2000                2005                2010

CAC ACC GAG GCG GCG CTG CGC GAG CAG AGC ACG AGG CTG CTG AAC GAC      26096
His Thr Glu Ala Ala Leu Arg Glu Gln Ser Thr Arg Leu Leu Asn Asp
    2015                2020                2025

CTG CTG GAG CAC CCG GAC GAG CAC CCG GCC GAC GTC GGC TAC ACC CTG      26144
Leu Leu Glu His Pro Asp Glu His Pro Ala Asp Val Gly Tyr Thr Leu
2030                2035                2040                2045

ATC ACC GGC AGG GCC CAC TTC GGG CAC CGG GCC GCC GTG ATC GGC GAG      26192
Ile Thr Gly Arg Ala His Phe Gly His Arg Ala Ala Val Ile Gly Glu
                2050                2055                2060

AGC CGG GAA GAA CTG CTC GAC GCC CTG AAG GCT CTG GCC GAG GGC CGC      26240
Ser Arg Glu Glu Leu Leu Asp Ala Leu Lys Ala Leu Ala Glu Gly Arg
            2065                2070                2075

GAG CAC CAC ACC GTG GTA CGG GGC GAC GGG ACG GCC CAC CCG GAC CGG      26288
Glu His His Thr Val Val Arg Gly Asp Gly Thr Ala His Pro Asp Arg
        2080                2085                2090
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CGC GTG GTC TTC GTC TTC CCC GGG CAG GGC TCG CAG TGG CCG TCG ATG      26336
Arg Val Val Phe Val Phe Pro Gly Gln Gly Ser Gln Trp Pro Ser Met
    2095                2100                2105

GCC CGG GAC CTG CTC GAC CGC GCG CCC GCC TTC CGC GAG ACG GCG AAG      26384
Ala Arg Asp Leu Leu Asp Arg Ala Pro Ala Phe Arg Glu Thr Ala Lys
2110                2115                2120                2125

GCC TGC GAC GCC GCG CTG AGC GTC CAT CTG GAC TGG TCC GTG CTC GAT      26432
Ala Cys Asp Ala Ala Leu Ser Val His Leu Asp Trp Ser Val Leu Asp
                2130                2135                2140

GTC CTC CAG GAG AAG CCG GAC GCG CCG CCG CTG AGC CGG GTC GAC GTG      26480
Val Leu Gln Glu Lys Pro Asp Ala Pro Pro Leu Ser Arg Val Asp Val
            2145                2150                2155

GTG CAG CCC GTG CTG TTC ACG ATG ATG CTG TCG CTC GCC GCC TGC TGG      26528
Val Gln Pro Val Leu Phe Thr Met Met Leu Ser Leu Ala Ala Cys Trp
        2160                2165                2170

CGG GAC CTC GGC GTC CAC CCG GCC GCC GTG GTG GGC CAC TCC CAG GGA      26576
Arg Asp Leu Gly Val His Pro Ala Ala Val Val Gly His Ser Gln Gly
    2175                2180                2185

GAG ATC GCG GCG GCC TGC GTG GCC GGC GCG CTC TCC CTG GAG GAC GCG      26624
Glu Ile Ala Ala Ala Cys Val Ala Gly Ala Leu Ser Leu Glu Asp Ala
2190                2195                2200                2205

GCG CGG ATC GTG GCG CTG CGC AGC CGG GCA TGG CTC ACA CTG GCC GGC      26672
Ala Arg Ile Val Ala Leu Arg Ser Arg Ala Trp Leu Thr Leu Ala Gly
                2210                2215                2220

AAG GGC GGC ATG GCC GCC GTC TCC CTG CCG GAA GCC CGG CTG CGC GAG      26720
Lys Gly Gly Met Ala Ala Val Ser Leu Pro Glu Ala Arg Leu Arg Glu
            2225                2230                2235

CGG ATC GAG CGG TTC GGG CAG CGG CTG TCG GTG GCC GCG GTG AAC AGC      26768
Arg Ile Glu Arg Phe Gly Gln Arg Leu Ser Val Ala Ala Val Asn Ser
        2240                2245                2250

CCG GGC ACG GCG GCG GTC GCC GGT GAC GTG GAC GCG CTG CGG GAA CTG      26816
Pro Gly Thr Ala Ala Val Ala Gly Asp Val Asp Ala Leu Arg Glu Leu
    2255                2260                2265

CTG GCG GAG CTG ACC GCG GAG GGC ATC CGG GCC AAG CCG ATC CCC GGC      26864
Leu Ala Glu Leu Thr Ala Glu Gly Ile Arg Ala Lys Pro Ile Pro Gly
2270                2275                2280                2285

GTG GAC ACG GCC GGC CAC TCC GCG CAG GTG GAC GGC CTG AAG GAG CAT      26912
Val Asp Thr Ala Gly His Ser Ala Gln Val Asp Gly Leu Lys Glu His
                2290                2295                2300

CTC TTC GAG GTG CTG GCG CCG GTC TCC CCG CGC TCC TCG GAC ATC CCG      26960
Leu Phe Glu Val Leu Ala Pro Val Ser Pro Arg Ser Ser Asp Ile Pro
            2305                2310                2315

TTC TAC TCG ACG GTG ACG GGC GCG CCG CTG GAC ACC GAG CGG CTG GAC      27008
Phe Tyr Ser Thr Val Thr Gly Ala Pro Leu Asp Thr Glu Arg Leu Asp
        2320                2325                2330
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GCC GGG TAC TGG TAC CGC AAC ATG CGG GAG CCC GTG GAG TTC GAG AAG      27056
Ala Gly Tyr Trp Tyr Arg Asn Met Arg Glu Pro Val Glu Phe Glu Lys
    2335                2340                2345

GCC GTC AGG GCA CTG ATC GCC GAC GGC TAC GAC CTG TTC CTG GAG TGC      27104
Ala Val Arg Ala Leu Ile Ala Asp Gly Tyr Asp Leu Phe Leu Glu Cys
2350                2355                2360                2365

AAC CCG CAC CCG ATG CTC GCC ATG TCG CTG GAC GAG ACA CTC ACC GAC      27152
Asn Pro His Pro Met Leu Ala Met Ser Leu Asp Glu Thr Leu Thr Asp
                2370                2375                2380

AGC GGC GGC CAC GGC ACC GTG ATG CAC ACC CTC CGC CGG CAG AAG GGC      27200
Ser Gly Gly His Gly Thr Val Met His Thr Leu Arg Arg Gln Lys Gly
            2385                2390                2395

AGC GCC AAG GAC TTC GGC ATG GCG CTC TGC CTC GCC TAT GTC AAC GGA      27248
Ser Ala Lys Asp Phe Gly Met Ala Leu Cys Leu Ala Tyr Val Asn Gly
        2400                2405                2410

CTG GAG ATC GAC GGA GAA GCC CTC TTC GGC CCC GAC TCA CGC CGG GTG      27296
Leu Glu Ile Asp Gly Glu Ala Leu Phe Gly Pro Asp Ser Arg Arg Val
    2415                2420                2425

AAC CCG CCG ACG TAC CCG TTC CAG CGG GAG CGC TAC TGG TAC CAC CCC      27344
Asn Pro Pro Thr Tyr Pro Phe Gln Arg Glu Arg Tyr Trp Tyr His Pro
2430                2435                2440                2445

ACG AGC GGC AGG CGC GGC GAC ATC ACG GCG GCC GGC GTG GCC GAG GCG      27392
Thr Ser Gly Arg Arg Gly Asp Ile Thr Ala Ala Gly Val Ala Glu Ala
                2450                2455                2460

GAG CAC CCG CTG CTC GGC GCC GGC GTC GAA CTC CCG GAG ACC GGG GGC      27440
Glu His Pro Leu Leu Gly Ala Gly Val Glu Leu Pro Glu Thr Gly Gly
            2465                2470                2475

ACG GTG TAC ACC GCG CGG TTC GGC CCG GAC AGC CGG CCG TGG CTG GCC      27488
Thr Val Tyr Thr Ala Arg Phe Gly Pro Asp Ser Arg Pro Trp Leu Ala
        2480                2485                2490

GAC CAC GCG CTG CTG GGC ACC GTG CTG CTG CCC GGC ACG GCA ATC CTG      27536
Asp His Ala Leu Leu Gly Thr Val Leu Leu Pro Gly Thr Ala Ile Leu
    2495                2500                2505

GAC CTG GTG CTG TGG GCG GGC GAA CGC TCC GGC TGC GGC CGC GTC GGT      27584
Asp Leu Val Leu Trp Ala Gly Glu Arg Ser Gly Cys Gly Arg Val Gly
2510                2515                2520                2525

GAA CTG GCG CTC CAG GCA CCG CTG GTC CTG CCG GAC AGC GGC GAC GTC      27632
Glu Leu Ala Leu Gln Ala Pro Leu Val Leu Pro Asp Ser Gly Asp Val
                2530                2535                2540

GAA CTG CGG CTG CTG GTC GGC GGC CCG GAC GAG GAG AAA CGG CGC ACC      27680
Glu Leu Arg Leu Leu Val Gly Gly Pro Asp Glu Glu Lys Arg Arg Thr
            2545                2550                2555

GTC ACC GTG CAC GCG CGG CCC GCG GCG GCC GGC GCC GAG GCG CCG TGG      27728
Val Thr Val His Ala Arg Pro Ala Ala Ala Gly Ala Glu Ala Pro Trp
        2560                2565                2570
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ACC CGG CAC GCC GAA GCC GTG GTG CTG CCC GCC ACC GGC GAG GAG CCG      27776
Thr Arg His Ala Glu Ala Val Val Leu Pro Ala Thr Gly Glu Glu Pro
    2575                2580                2585

ACC CCC GCC CCG CGC CCC GTC CCC GAG CCG GCG GGC ACC ACG GAC CCC      27824
Thr Pro Ala Pro Arg Pro Val Pro Glu Pro Ala Gly Thr Thr Asp Pro
2590                2595                2600                2605

GCC GCG TTC TAC GCG GAG TTC GCC GAG CGC GGC TAC GAC TAC GGC CCG      27872
Ala Ala Phe Tyr Ala Glu Phe Ala Glu Arg Gly Tyr Asp Tyr Gly Pro
                2610                2615                2620

GCC TTC CAG GGC TTC ACC GCC GGA GCG CGC CAC GGC GAG GAC GTC GTC      27920
Ala Phe Gln Gly Phe Thr Ala Gly Ala Arg His Gly Glu Asp Val Val
            2625                2630                2635

GCC GAG GTG GCG CTG CCC AGC GGC CTG GTG GCG GAC GCC CGT CAC CAC      27968
Ala Glu Val Ala Leu Pro Ser Gly Leu Val Ala Asp Ala Arg His His
        2640                2645                2650

CGG CTG CAC CCG GCG CTG CTC GAC GCC GCG CTC CAG GCG ATG ATC CTC      28016
Arg Leu His Pro Ala Leu Leu Asp Ala Ala Leu Gln Ala Met Ile Leu
    2655                2660                2665

GGC ACG TTC TTT GCC GAC GAC GGC CGC GCC CGG ATG CCG TTC GCG GTG      28064
Gly Thr Phe Phe Ala Asp Asp Gly Arg Ala Arg Met Pro Phe Ala Val
2670                2675                2680                2685

CGC GGA GTA CGG CTG CAC ACG GCC GGC GCC GAC CGG CTG CGC GTC CTG      28112
Arg Gly Val Arg Leu His Thr Ala Gly Ala Asp Arg Leu Arg Val Leu
                2690                2695                2700

ATC TCC CCG GCG GGC GAC GAG ACC GTA CGG CTG CTC TGC ACC GAC CTC      28160
Ile Ser Pro Ala Gly Asp Glu Thr Val Arg Leu Leu Cys Thr Asp Leu
            2705                2710                2715

GCG ACC GGC GCC CCC GTG CTG GAG ATC GAC GAA CTG GTC GTC CGC CCG      28208
Ala Thr Gly Ala Pro Val Leu Glu Ile Asp Glu Leu Val Val Arg Pro
        2720                2725                2730

GTG TCC GGC GAG CAG TTG GCG GCC GGC GCC CCG GGC CGC AAC GGC GGC      28256
Val Ser Gly Glu Gln Leu Ala Ala Gly Ala Pro Gly Arg Asn Gly Gly
    2735                2740                2745

GAG CTG TAC CGG GTC GAC TGG ACG GTG CTG CCG GAG CCC GCC GAG GTG      28304
Glu Leu Tyr Arg Val Asp Trp Thr Val Leu Pro Glu Pro Ala Glu Val
2750                2755                2760                2765

CCC GCG CCG CGC TGG GCC CTC CTC GGC GAG GAC CAC GCC GGC CTG GCC      28352
Pro Ala Pro Arg Trp Ala Leu Leu Gly Glu Asp His Ala Gly Leu Ala
                2770                2775                2780

GAT GTG CTC GGA GGG ACG GGC GGC GGC TGC GAG CGG TAC GAC ACC CTC      28400
Asp Val Leu Gly Gly Thr Gly Gly Gly Cys Glu Arg Tyr Asp Thr Leu
            2785                2790                2795

ACC GGC CTG CTG GAG GCC ACC ACC CGG TCG GCC GGC GGA ATC CTG CCC      28448
Thr Gly Leu Leu Glu Ala Thr Thr Arg Ser Ala Gly Gly Ile Leu Pro
        2800                2805                2810
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GAC ATC GTC GCG CTC TCC TTG CCC ACC GCC CCG GAG CCC GGC CCC CAG      28496
Asp Ile Val Ala Leu Ser Leu Pro Thr Ala Pro Glu Pro Gly Pro Gln
    2815                2820                2825

GCG GTG CGC GAG GTG CTG TCC CAG GCG CTC GAC GCC GCC CAG GCG TGG      28544
Ala Val Arg Glu Val Leu Ser Gln Ala Leu Asp Ala Ala Gln Ala Trp
2830                2835                2840                2845

CTG GCC GCC GGC GCC GAG ACC GCC TCC GCC CGG CTG GTG TTC GTC ACC      28592
Leu Ala Ala Gly Ala Glu Thr Ala Ser Ala Arg Leu Val Phe Val Thr
                2850                2855                2860

GGC GGC GCG GTG GCC ACC ACG GCG GAC GAA ACC GTG CGC GAC ATC GCG      28640
Gly Gly Ala Val Ala Thr Thr Ala Asp Glu Thr Val Arg Asp Ile Ala
            2865                2870                2875

GCG GCC GCC GTC TGG GGC CTG GTC CGC TCG GCG CAG TCC GAG GAA CCC      28688
Ala Ala Ala Val Trp Gly Leu Val Arg Ser Ala Gln Ser Glu Glu Pro
        2880                2885                2890

GAC CGC ATG GTC CTG CTC GAC CTG GAC GGC GAG CGG CCC ACC GCG CGG      28736
Asp Arg Met Val Leu Leu Asp Leu Asp Gly Glu Arg Pro Thr Ala Arg
    2895                2900                2905

ACG CTG GCG GCG GCG CTC GCG TCC GGC GAA CCG CAA CTC GCC GTG CGC      28784
Thr Leu Ala Ala Ala Leu Ala Ser Gly Glu Pro Gln Leu Ala Val Arg
2910                2915                2920                2925

GGC TCC ACG GTG GCC GCT CCC CGG CTG GCC CCG GCC GGG CCC GGC CCG      28832
Gly Ser Thr Val Ala Ala Pro Arg Leu Ala Pro Ala Gly Pro Gly Pro
                2930                2935                2940

GAG GAC CTC GTA CCG CCC GCC GGC ACC ACC GCC TGG CGG CTC ACC CCC      28880
Glu Asp Leu Val Pro Pro Ala Gly Thr Thr Ala Trp Arg Leu Thr Pro
            2945                2950                2955

GGC GGG GGG ACG CTG GAG GAA CTG TCG CTC GCG CCC GCC CCC GAC GCG      28928
Gly Gly Gly Thr Leu Glu Glu Leu Ser Leu Ala Pro Ala Pro Asp Ala
        2960                2965                2970

GAG GAA CCA CTG GCA CCG GGC CAG GTA CGC ATC GCC GTC CGC GCG GCG      28976
Glu Glu Pro Leu Ala Pro Gly Gln Val Arg Ile Ala Val Arg Ala Ala
    2975                2980                2985

GGC GTG AAC TTC CGC GAC GCC CTG ATC GCC CTC GGC ATG TAC CCG GGC      29024
Gly Val Asn Phe Arg Asp Ala Leu Ile Ala Leu Gly Met Tyr Pro Gly
2990                2995                3000                3005

AAG GGA ACC ATG GGC GCC GAG GGA GCC GGC GTC GTC GTC GAG ACC GCC      29072
Lys Gly Thr Met Gly Ala Glu Gly Ala Gly Val Val Val Glu Thr Ala
                3010                3015                3020

CCC GAT GTC ACC GGC CTC TCC GCC GGA GAC CGC GTG CTC GGC ATG TGG      29120
Pro Asp Val Thr Gly Leu Ser Ala Gly Asp Arg Val Leu Gly Met Trp
            3025                3030                3035

AAC GGC GGC TTC GGG CCC CTC GTG GTG GCC GAC CAC CGC ATG GTG GCC      29168
Asn Gly Gly Phe Gly Pro Leu Val Val Ala Asp His Arg Met Val Ala
        3040                3045                3050
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CCG ATC CCC CAC GGC TGG TCG TAC GCC GAG GCG GCC TCC GTG CCC GCC      29216
Pro Ile Pro His Gly Trp Ser Tyr Ala Glu Ala Ala Ser Val Pro Ala
    3055                3060                3065

GTG CTC CTC ACC TCC TAC TAC GCG CTG ACC CGG CTG GCC CGG GCC CGC      29264
Val Leu Leu Thr Ser Tyr Tyr Ala Leu Thr Arg Leu Ala Arg Ala Arg
3070                3075                3080                3085

ACC GGA CAG ACC GTC CTC GTC CAC GCC GCC GCC GGC GGT GTC GGC ATG      29312
Thr Gly Gln Thr Val Leu Val His Ala Ala Ala Gly Gly Val Gly Met
                3090                3095                3100

GCG ACC CTC CAA CTC GCC CGC CAC CTC GGC CTG GAG GTG TAC GCC ACC      29360
Ala Thr Leu Gln Leu Ala Arg His Leu Gly Leu Glu Val Tyr Ala Thr
            3105                3110                3115

GCG AGC ACC GGC AAA TGG GAC GCC CTG CAG AAG CAC GGC ATC CCC GAC      29408
Ala Ser Thr Gly Lys Trp Asp Ala Leu Gln Lys His Gly Ile Pro Asp
        3120                3125                3130

GAC CGC ATC GCC GAC TCC CGC ACC CTG GAC TTC GCC GAG CGC TTC CTG      29456
Asp Arg Ile Ala Asp Ser Arg Thr Leu Asp Phe Ala Glu Arg Phe Leu
    3135                3140                3145

TCC CGG ACG GGC GGC CGG GGT GTC GAC ATC GTG CTG AAC TCC CTG GCC      29504
Ser Arg Thr Gly Gly Arg Gly Val Asp Ile Val Leu Asn Ser Leu Ala
3150                3155                3160                3165

GGC GAG TTC GTC GAC GCC TCA CTG CGG CTG CTG CCG CGC GGC GGG CAC      29552
Gly Glu Phe Val Asp Ala Ser Leu Arg Leu Leu Pro Arg Gly Gly His
                3170                3175                3180

TTC CTG GAA CTC GGC AAG GCC GAC GTC CGC GAC CCC CGG CGG ATC GCC      29600
Phe Leu Glu Leu Gly Lys Ala Asp Val Arg Asp Pro Arg Arg Ile Ala
            3185                3190                3195

GCC GCC CAT CCG GGC ACC GAC TAC CGG GCG TTC GAC CTG GTG CAG GCC      29648
Ala Ala His Pro Gly Thr Asp Tyr Arg Ala Phe Asp Leu Val Gln Ala
        3200                3205                3210

GGT CCC GAC ACC GTC GGG GAG ATG CTC GGG GAA CTG CTG GAA CTG TTC      29696
Gly Pro Asp Thr Val Gly Glu Met Leu Gly Glu Leu Leu Glu Leu Phe
    3215                3220                3225

GCG GCC GGA GCG CTG CGC CCG CTG CCG CTC ACC GCC TAC GGC ATA CGC      29744
Ala Ala Gly Ala Leu Arg Pro Leu Pro Leu Thr Ala Tyr Gly Ile Arg
3230                3235                3240                3245

GAC GCC CGC ACC GCC TTG CGC ACC CTC AGC CAG GCC CGG CAC ACC GGC      29792
Asp Ala Arg Thr Ala Leu Arg Thr Leu Ser Gln Ala Arg His Thr Gly
                3250                3255                3260

AAG CTC GTG CTG ACG GTG CCT GCC GGA TTC GAC ACC CAC CGC ACG GTG      29840
Lys Leu Val Leu Thr Val Pro Ala Gly Phe Asp Thr His Arg Thr Val
            3265                3270                3275

CTC CTC ACC GGC GGC ACG GGC ACG CTC GGC CAG ACA CTC GCC CGC CAT      29888
Leu Leu Thr Gly Gly Thr Gly Thr Leu Gly Gln Thr Leu Ala Arg His
        3280                3285                3290
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CTG GTC AAC CGC CAC GGC GTA CGG CAC CTG CTG CTC GCC GGC CGC ACC      29936
Leu Val Asn Arg His Gly Val Arg His Leu Leu Leu Ala Gly Arg Thr
    3295                3300                3305

GGC GCG GCG GCC GAG GGC GTC GCG GAA CTG ATT GGT GAA CTG GGC GAG      29984
Gly Ala Ala Ala Glu Gly Val Ala Glu Leu Ile Gly Glu Leu Gly Glu
3310                3315                3320                3325

TTG GGC GCC GAG GTC CGG GTC GCG GCC TGC GAC GCG GCC GAC CGG CAG      30032
Leu Gly Ala Glu Val Arg Val Ala Ala Cys Asp Ala Ala Asp Arg Gln
                3330                3335                3340

CGG CTC ACC GAA CTC CTC GCC GGA ATC CCC GTC GAG CAC CCG CTC GGC      30080
Arg Leu Thr Glu Leu Leu Ala Gly Ile Pro Val Glu His Pro Leu Gly
            3345                3350                3355

GCC GTC GTC CAC GCC GCG GGC ACC CTC GAC GAC GGC ACC ATC CCC TCA      30128
Ala Val Val His Ala Ala Gly Thr Leu Asp Asp Gly Thr Ile Pro Ser
        3360                3365                3370

CTG ACC GGC GAG AAC ATC GAC AAC GTG CTG CGG CCC AAG GCC GAC GCC      30176
Leu Thr Gly Glu Asn Ile Asp Asn Val Leu Arg Pro Lys Ala Asp Ala
    3375                3380                3385

GTG CTC AAC CTG CAC GAG CTG ACC CGC GAC GCC GAC CTC TCG GCG TTC      30224
Val Leu Asn Leu His Glu Leu Thr Arg Asp Ala Asp Leu Ser Ala Phe
3390                3395                3400                3405

GTC CTC TAC TCG TCC TCC TCG GCG CTG CTC GGC AGC CCC GGC CAG GGC      30272
Val Leu Tyr Ser Ser Ser Ser Ala Leu Leu Gly Ser Pro Gly Gln Gly
                3410                3415                3420

GCC TAC GCC GCG GCC AAC GCC TTC CTG GAC GGC TTC GCC CGA TAC CGC      30320
Ala Tyr Ala Ala Ala Asn Ala Phe Leu Asp Gly Phe Ala Arg Tyr Arg
            3425                3430                3435

AAG GGC CTC GGG CTG CCG GCG CTC TCG CTG GCC TGG GGA CTG TGG GGC      30368
Lys Gly Leu Gly Leu Pro Ala Leu Ser Leu Ala Trp Gly Leu Trp Gly
        3440                3445                3450

AGC AAC AGC CGC ATG GCG GGC CAC CTC GAC CAG TCG GGC ATG CAA CGG      30416
Ser Asn Ser Arg Met Ala Gly His Leu Asp Gln Ser Gly Met Gln Arg
    3455                3460                3465

CGC CTG AAC CGG AGC GGC ATC ATG GCG CTC ACC GAC GCC GAG GGC CTC      30464
Arg Leu Asn Arg Ser Gly Ile Met Ala Leu Thr Asp Ala Glu Gly Leu
3470                3475                3480                3485

GCC CTG TTC GAC GCC GCA CAG GAC GGC GGG GAC GCG CTG CTG GTG CCG      30512
Ala Leu Phe Asp Ala Ala Gln Asp Gly Gly Asp Ala Leu Leu Val Pro
                3490                3495                3500

ATG CGG CTC AAC CGG ACG GCC CTT CGC GCC TCG GGA CGG ATC ACC CCG      30560
Met Arg Leu Asn Arg Thr Ala Leu Arg Ala Ser Gly Arg Ile Thr Pro
            3505                3510                3515

TTC CTC AGC GGC TTG GCC GGC GGC GGG CCG GCG GCG GGG GAG AGG CGC      30608
Phe Leu Ser Gly Leu Ala Gly Gly Gly Pro Ala Ala Gly Glu Arg Arg
        3520                3525                3530
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CCC GAG GTG GCA GCC GTA TCC GGG ACA CTC GCG GAA CGG CTG ACC GGG      30656
Pro Glu Val Ala Ala Val Ser Gly Thr Leu Ala Glu Arg Leu Thr Gly
    3535                3540                3545

CTC ACG GCA CAG GAA GGG CAC GCC CTC GTC CTG GCC GAG ATC CGC GCC      30704
Leu Thr Ala Gln Glu Gly His Ala Leu Val Leu Ala Glu Ile Arg Ala
3550                3555                3560                3565

CAC GCG GCG GCG GTG CTG GGC CAC GGC TCC GAC GAC TCG ATC CCC GAG      30752
His Ala Ala Ala Val Leu Gly His Gly Ser Asp Asp Ser Ile Pro Glu
                3570                3575                3580

GAC CGG GCC TTC AAG GAC CTC GGC TTC GAC TCG CTC ACC GCC GTG GAG      30800
Asp Arg Ala Phe Lys Asp Leu Gly Phe Asp Ser Leu Thr Ala Val Glu
            3585                3590                3595

ATG CGC AAC CGG CTG AGC GCG GCC ACC GGC CTC CGG CTG CCC GCC ACC      30848
Met Arg Asn Arg Leu Ser Ala Ala Thr Gly Leu Arg Leu Pro Ala Thr
        3600                3605                3610

CTC GTC TTC GAC CAC CCG ACC CCG GGC GAG CTG GCC GGC CAC CTG AGT      30896
Leu Val Phe Asp His Pro Thr Pro Gly Glu Leu Ala Gly His Leu Ser
    3615                3620                3625

GCT GAA CTG TCC GCC GAC GAT GCC CCG GGC AGC GCC TCC CCG CTT ACC      30944
Ala Glu Leu Ser Ala Asp Asp Ala Pro Gly Ser Ala Ser Pro Leu Thr
3630                3635                3640                3645

GAA CTC GAC CGT TTC GAA GCC CTG TTC ACC GCT CTC GCA CCG GGG ACC      30992
Glu Leu Asp Arg Phe Glu Ala Leu Phe Thr Ala Leu Ala Pro Gly Thr
                3650                3655                3660

ACC AAG GAC ACC CCG GGC GGG GCC GGG GCA CTG ATG ATC GAC GAG GCC      31040
Thr Lys Asp Thr Pro Gly Gly Ala Gly Ala Leu Met Ile Asp Glu Ala
            3665                3670                3675

GAG CGC CAA GAG ATC GCC GGG CGG CTC GCG GCG CTG GCC GGT CTG TGG      31088
Glu Arg Gln Glu Ile Ala Gly Arg Leu Ala Ala Leu Ala Gly Leu Trp
        3680                3685                3690

AAC CGG CTG CAC GGC ACC ACG ACG GCT CCT GAG GAC GGC GAC ACC GTC      31136
Asn Arg Leu His Gly Thr Thr Thr Ala Pro Glu Asp Gly Asp Thr Val
    3695                3700                3705

GCG GAC GCC CTG GAA GCC GCG GAC GAC CAC GAG ATC TTC GCA TTC CTC      31184
Ala Asp Ala Leu Glu Ala Ala Asp Asp His Glu Ile Phe Ala Phe Leu
3710                3715                3720                3725

GAC GAG CGG TTC TGA GCCCGCCCCA GCGACAGCAC AGGTGAAAAC AC ATG GCC      31237
Asp Glu Arg Phe *                                       Met Ala
                3730                                    1

AAC GCG AAC GAG CAG CAA CTC CGT GCC TAT CTG AAG CGA GCG ACG ACC      31285
Asn Ala Asn Glu Gln Gln Leu Arg Ala Tyr Leu Lys Arg Ala Thr Thr
        5                   10                  15

GAA CTC CAC CGT ACC TCC GAA CAA CTG AGG GAG GAG CGG GCA CGG GCC      31333
Glu Leu His Arg Thr Ser Glu Gln Leu Arg Glu Glu Arg Ala Arg Ala
    20                  25                  30
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CAC GAG CCG ATC GCC GTC GTC GGC ATG GCC TGC CGC TAC CCC GGA GGC      31381
His Glu Pro Ile Ala Val Val Gly Met Ala Cys Arg Tyr Pro Gly Gly
35                  40                  45                  50

GCG AAC ACC CCC GAA CAG TTC TGG GAA CTG CTC GAC ACC GGC ACC GAC      31429
Ala Asn Thr Pro Glu Gln Phe Trp Glu Leu Leu Asp Thr Gly Thr Asp
                55                  60                  65

GCC GCC GCG CCG ATG CCC TCC GAC CGG GGA TGG GAC ACC CAC GGG CTG      31477
Ala Ala Ala Pro Met Pro Ser Asp Arg Gly Trp Asp Thr His Gly Leu
            70                  75                  80

TAC GAC CCC GAC CCG GCG GCA GCG GGG CGC ACC TAC TGC CGG GAG GGC      31525
Tyr Asp Pro Asp Pro Ala Ala Ala Gly Arg Thr Tyr Cys Arg Glu Gly
        85                  90                  95

GGC TTC CTC CAC GAC GCG GGC GAC TTC GAC GCG GAC TTC TTC GGG ATT      31573
Gly Phe Leu His Asp Ala Gly Asp Phe Asp Ala Asp Phe Phe Gly Ile
    100                 105                 110

TCG CCG CGT GAG GCG GTG GCG ATG GAT CCG CAG CAG CGG CTG TTG CTG      31621
Ser Pro Arg Glu Ala Val Ala Met Asp Pro Gln Gln Arg Leu Leu Leu
115                 120                 125                 130

GAG ACC TCC TGG GAG GCG ATC GAA GCG GCC GGT ATC GAC CCG CGA GGA      31669
Glu Thr Ser Trp Glu Ala Ile Glu Ala Ala Gly Ile Asp Pro Arg Gly
                135                 140                 145

CTC CGC GGC AGC CGC ACC GGG GTG TAC GTG GGC GCC TGG GAC AGC GGC      31717
Leu Arg Gly Ser Arg Thr Gly Val Tyr Val Gly Ala Trp Asp Ser Gly
            150                 155                 160

TAC ACC GGC CAG GCG CAC GCG CCC TCG GCC GAG TTG GAG GCC GAC CTG      31765
Tyr Thr Gly Gln Ala His Ala Pro Ser Ala Glu Leu Glu Ala Asp Leu
        165                 170                 175

CTG ACC GGC GGC GTC GTC AGC TTC ACC TCC GGC CGT ATC GCC TAC ACG      31813
Leu Thr Gly Gly Val Val Ser Phe Thr Ser Gly Arg Ile Ala Tyr Thr
    180                 185                 190

CTG GGG CTG GAG GGT CCG GCC TTG ACC GTG GAC ACC GCG TGT TCG TCG      31861
Leu Gly Leu Glu Gly Pro Ala Leu Thr Val Asp Thr Ala Cys Ser Ser
195                 200                 205                 210

TCG CTG GTC GCC CTG CAC AAC GCG GCG CAG GCG CTG CGG CGC GGC GAA      31909
Ser Leu Val Ala Leu His Asn Ala Ala Gln Ala Leu Arg Arg Gly Glu
                215                 220                 225

TGC GAC CTG GCG TTG GCC GGT GGT GTG ACG GTG ATG GCG ACC CCG GCG      31957
Cys Asp Leu Ala Leu Ala Gly Gly Val Thr Val Met Ala Thr Pro Ala
            230                 235                 240

GTG TTC GTC CAG TTC GCC CGG CAG CGA GGG CTG GCG CCG GAC GGC CGC      32005
Val Phe Val Gln Phe Ala Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg
        245                 250                 255

TGC AAG GCG TTC GCC GAC GCC GCC GAC GGC TTC GGC CCC GCC GAG GGT      32053
Cys Lys Ala Phe Ala Asp Ala Ala Asp Gly Phe Gly Pro Ala Glu Gly
    260                 265                 270
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GTG GGG ATG GTG CTG GTG GAG CGG TTG TCG GAT GCC CGG CGG TTG GGG      32101
Val Gly Met Val Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Leu Gly
275                 280                 285                 290

CAT CCG GTG TTG GCG GTG GTG TGT GGG TCG GCG GTG AAT CAG GAC GGT      32149
His Pro Val Leu Ala Val Val Cys Gly Ser Ala Val Asn Gln Asp Gly
                295                 300                 305

GCG TCG AAT GGT TTG ACG GCG CCG AGT GGT CCG TCG CAG GAG CGG GTG      32197
Ala Ser Asn Gly Leu Thr Ala Pro Ser Gly Pro Ser Gln Glu Arg Val
            310                 315                 320

ATT CGT CAG GCG TTG GGG AAT GCG CGG TTG ACG GTG GCG GAT GTG GAT      32245
Ile Arg Gln Ala Leu Gly Asn Ala Arg Leu Thr Val Ala Asp Val Asp
        325                 330                 335

GTG GTG GAG GCG CAT GGG ACG GGG ACG CGG CTG GGT GAT CCG ATC GAG      32293
Val Val Glu Ala His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu
    340                 345                 350

GCG CAG GCG TTG CTG GGG ACG TAT GGG CGG GAT CGT GAT GGT GGG CGT      32341
Ala Gln Ala Leu Leu Gly Thr Tyr Gly Arg Asp Arg Asp Gly Gly Arg
355                 360                 365                 370

CCG GTG TGG TTG GGG TCG TTG AAG TCG AAT ATT GGT CAT GCT CAG GCG      32389
Pro Val Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Ala Gln Ala
                375                 380                 385

GCT GCG GGG GTG GCT GGT GTG ATC AAG ATG GTG TTG GCG ATG CGG TAT      32437
Ala Ala Gly Val Ala Gly Val Ile Lys Met Val Leu Ala Met Arg Tyr
            390                 395                 400

GGG TGG TTG CCG CGG ACG TTG CAT GTG GAT GAG CCG AGC CGG CAT GTG      32485
Gly Trp Leu Pro Arg Thr Leu His Val Asp Glu Pro Ser Arg His Val
        405                 410                 415

GAC TGG TCG GCT GGT GGT GTG CGG TTG CTG ACC GAG GCG CGG GAG TGG      32533
Asp Trp Ser Ala Gly Gly Val Arg Leu Leu Thr Glu Ala Arg Glu Trp
    420                 425                 430

CCG GGG GTG GAC CGG CCG CGT CGG GCG GCG GTC TCC GCC TTT GGT GTC      32581
Pro Gly Val Asp Arg Pro Arg Arg Ala Ala Val Ser Ala Phe Gly Val
435                 440                 445                 450

AGT GGT ACC AAC GCC CAT CTG ATC CTC GAA GCC CCC GAC ACC GCC GAG      32629
Ser Gly Thr Asn Ala His Leu Ile Leu Glu Ala Pro Asp Thr Ala Glu
                455                 460                 465

GCG GAG AGC GCC ACG ACC CCG GTC CGC TCT GAG GTG TCG GAG TCT GCT      32677
Ala Glu Ser Ala Thr Thr Pro Val Arg Ser Glu Val Ser Glu Ser Ala
            470                 475                 480

GCG GTC CTC GAT GCC CGC AGT GGT GTG GTG CCG GTG GTG GTT TCG GGG      32725
Ala Val Leu Asp Ala Arg Ser Gly Val Val Pro Val Val Val Ser Gly
        485                 490                 495

CGT TCG CGG GTG GTG GTG CGG GAG GCT GCG GGC CGG TTG GCG GAG GTG      32773
Arg Ser Arg Val Val Val Arg Glu Ala Ala Gly Arg Leu Ala Glu Val
    500                 505                 510
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GTG GAG GCC GGT GGT GTG GGG CTG GCG GAT GTG GCG GTG ACG ATG GCG      32821
Val Glu Ala Gly Gly Val Gly Leu Ala Asp Val Ala Val Thr Met Ala
515                 520                 525                 530

GGC CGG TCG CGG TTT GGG TAT CGG GCG GTT GTG CTG GCT CGG GGT GAG      32869
Gly Arg Ser Arg Phe Gly Tyr Arg Ala Val Val Leu Ala Arg Gly Glu
                535                 540                 545

GCT GAG CTT GCC GGG CGT TTG CGG GCG TTG GCG GGG GGT GAT CCG GAC      32917
Ala Glu Leu Ala Gly Arg Leu Arg Ala Leu Ala Gly Gly Asp Pro Asp
            550                 555                 560

GCG GGT GTG GTC ACG GGT GCG GTG GTG GAC CCG GAG ACG GGG TCC GGT      32965
Ala Gly Val Val Thr Gly Ala Val Val Asp Pro Glu Thr Gly Ser Gly
        565                 570                 575

GGT GGG GGG GTG GTG TTG GTT TTC CCT GGT CAG GGG ACG CAG TGG GTG      33013
Gly Gly Gly Val Val Leu Val Phe Pro Gly Gln Gly Thr Gln Trp Val
    580                 585                 590

GGG ATG GGT GCG GGG CTG CTG GGG TCT TCG GAG GTG TTT GCG GCG TCG      33061
Gly Met Gly Ala Gly Leu Leu Gly Ser Ser Glu Val Phe Ala Ala Ser
595                 600                 605                 610

ATG CGG GAG TGT GCG CGG GCG CTG AGT GTT CAT GTG GGG TGG GAT TTG      33109
Met Arg Glu Cys Ala Arg Ala Leu Ser Val His Val Gly Trp Asp Leu
                615                 620                 625

CTG GAG GTG GTG TCG GGC GGG GCC GGG TTG GAG CGG GTG GAT GTG GTG      33157
Leu Glu Val Val Ser Gly Gly Ala Gly Leu Glu Arg Val Asp Val Val
            630                 635                 640

CAG CCG GTG ACG TGG GCG GTG ATG GTG TCG CTG GCC CGG TAC TGG CAG      33205
Gln Pro Val Thr Trp Ala Val Met Val Ser Leu Ala Arg Tyr Trp Gln
        645                 650                 655

GCG ATG GGT GTG GAC GTG GCT GCG GTG GTG GGT CAT TCC CAG GGG GAG      33253
Ala Met Gly Val Asp Val Ala Ala Val Val Gly His Ser Gln Gly Glu
    660                 665                 670

ATC GCT GCT GCC ACG GTG GCG GGG GCG TTG TCG CTG GAG GAT GCG GCG      33301
Ile Ala Ala Ala Thr Val Ala Gly Ala Leu Ser Leu Glu Asp Ala Ala
675                 680                 685                 690

GCT GTG GTC GCT CTG CGG GCG GGG TTG ATT GGC CGG TAT CTG GCG GGT      33349
Ala Val Val Ala Leu Arg Ala Gly Leu Ile Gly Arg Tyr Leu Ala Gly
                695                 700                 705

CGT GGT GCG ATG GCG GCT GTT CCG CTG CCT GCC GGC GAG GTC GAG GCC      33397
Arg Gly Ala Met Ala Ala Val Pro Leu Pro Ala Gly Glu Val Glu Ala
            710                 715                 720

GGG CTG GCG AAG TGG CCG GGT GTG GAG GTC GCG GCG GTC AAC GGT CCG      33445
Gly Leu Ala Lys Trp Pro Gly Val Glu Val Ala Ala Val Asn Gly Pro
        725                 730                 735

GCG TCT ACG GTG GTT TCC GGG GAT CGG CGG GCG GTG GCC GGT TAT GTG      33493
Ala Ser Thr Val Val Ser Gly Asp Arg Arg Ala Val Ala Gly Tyr Val
    740                 745                 750
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GCC GTC TGT CAG GCG GAG GGT GTG CAG GCT CGG TTG ATA CCG GTG GAC      33541
Ala Val Cys Gln Ala Glu Gly Val Gln Ala Arg Leu Ile Pro Val Asp
755                 760                 765                 770

TAC GCC TCT CAC TCC CGC CAT GTG GAG GAC CTG AAG GGC GAG TTG GAG      33589
Tyr Ala Ser His Ser Arg His Val Glu Asp Leu Lys Gly Glu Leu Glu
                775                 780                 785

CGG GTG CTG TCC GGT ATC CGC CCC CGC AGT CCG CGG GTG CCG GTG TGT      33637
Arg Val Leu Ser Gly Ile Arg Pro Arg Ser Pro Arg Val Pro Val Cys
            790                 795                 800

TCC ACC GTC GCC GGA GAG CAG CCG GGC GAG CCG GTT TTC GAT GCG GGG      33685
Ser Thr Val Ala Gly Glu Gln Pro Gly Glu Pro Val Phe Asp Ala Gly
        805                 810                 815

TAT TGG TTC CGT AAT CTG CGG AAC CGG GTT GAG TTC TCC GCG GTG GTC      33733
Tyr Trp Phe Arg Asn Leu Arg Asn Arg Val Glu Phe Ser Ala Val Val
    820                 825                 830

GGT GGT TTG TTG GAG GAG GGC CAC CGT CGG TTC ATC GAG GTC AGT GCC      33781
Gly Gly Leu Leu Glu Glu Gly His Arg Arg Phe Ile Glu Val Ser Ala
835                 840                 845                 850

CAC CCG GTA CTC GTC CAT GCC ATT GAG CAG ACG GCC GAG GCC GCG GAC      33829
His Pro Val Leu Val His Ala Ile Glu Gln Thr Ala Glu Ala Ala Asp
                855                 860                 865

CGG AGT GTC CAT GCC ACC GGG ACC CTG CGC CGC CAG GAC GAC AGC CCG      33877
Arg Ser Val His Ala Thr Gly Thr Leu Arg Arg Gln Asp Asp Ser Pro
            870                 875                 880

CAC CGC CTG CTG ACC TCC ACC GCC GAG GCC TGG GCC CAC GGC GCC ACC      33925
His Arg Leu Leu Thr Ser Thr Ala Glu Ala Trp Ala His Gly Ala Thr
        885                 890                 895

CTC ACC TGG GAC CCC GCC CTG CCC CCA GGC CAC CTC ACC ACC CTC CCC      33973
Leu Thr Trp Asp Pro Ala Leu Pro Pro Gly His Leu Thr Thr Leu Pro
    900                 905                 910

ACC TAC CCC TTC AAC CAC CAC CAC TAC TGG CTC GAC ACC ACC CCC ACC      34021
Thr Tyr Pro Phe Asn His His His Tyr Trp Leu Asp Thr Thr Pro Thr
915                 920                 925                 930

ACC CCC GCG ACG ACC ACC CAG AGC CCC ACC GAT GCC TGG CGC TAC CGC      34069
Thr Pro Ala Thr Thr Thr Gln Ser Pro Thr Asp Ala Trp Arg Tyr Arg
                935                 940                 945

GTC ACC TGG AAA GCC CTG ACC GAA GAA TCC ACT CCG GCC TCG TCC CCC      34117
Val Thr Trp Lys Ala Leu Thr Glu Glu Ser Thr Pro Ala Ser Ser Pro
            950                 955                 960

TCC GGT CAC TGG CTC CTC GTC ACA CCC CCG ACC CCC GAA GGC CGC ACG      34165
Ser Gly His Trp Leu Leu Val Thr Pro Pro Thr Pro Glu Gly Arg Thr
        965                 970                 975

CTC GGG GAC CGG GCC GCC GGC GCC CTC GCA CGT CAG GGG GCC ACG GTG      34213
Leu Gly Asp Arg Ala Ala Gly Ala Leu Ala Arg Gln Gly Ala Thr Val
    980                 985                 990
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GAA CGG CTG GTG GTC GAT CCG GTC GCC GTC GGA CGC GAC GGG CTC GCG      34261
Glu Arg Leu Val Val Asp Pro Val Ala Val Gly Arg Asp Gly Leu Ala
995                 1000                1005                1010

GCG CGC CTG GGC GAA CGG TGG GAC GGT GTG CTG TCC CTG CTC GGC GCC      34309
Ala Arg Leu Gly Glu Arg Trp Asp Gly Val Leu Ser Leu Leu Gly Ala
                1015                1020                1025

GAC GAG CGT CCG CTC CCA CGG CAT CCC GCC CTC AAC CGC GCC GTC ATG      34357
Asp Glu Arg Pro Leu Pro Arg His Pro Ala Leu Asn Arg Ala Val Met
            1030                1035                1040

GGC ACC ACG CTG CTC GCC CAG GCC GCT CTG GAC GCA GGA TGC GAG GCG      34405
Gly Thr Thr Leu Leu Ala Gln Ala Ala Leu Asp Ala Gly Cys Glu Ala
        1045                1050                1055

CGG ATA TGG GCC GTG ACG CGG GAG GCC GTC GCC GTC TCC CCG AGC GAG      34453
Arg Ile Trp Ala Val Thr Arg Glu Ala Val Ala Val Ser Pro Ser Glu
    1060                1065                1070

GTG CCG CGG GAC GCC GGC GCG CAG CTC TGG GGG CTC GGG CGG GGC ATC      34501
Val Pro Arg Asp Ala Gly Ala Gln Leu Trp Gly Leu Gly Arg Gly Ile
1075                1080                1085                1090

GCG CTG GAA CAC CCC TCC CTC TGG GGC GGA TTG ATC GAT CTG CCC GCC      34549
Ala Leu Glu His Pro Ser Leu Trp Gly Gly Leu Ile Asp Leu Pro Ala
                1095                1100                1105

GTG CCG GAC GAA CGC GCG TGG GCC AGG GCC GTC CGG CGG CTC GTC CCG      34597
Val Pro Asp Glu Arg Ala Trp Ala Arg Ala Val Arg Arg Leu Val Pro
            1110                1115                1120

CAC GGT GAG GAC CAG ATC GCC GCG CGC GCC TCG GGT GCC TAT GGG CGC      34645
His Gly Glu Asp Gln Ile Ala Ala Arg Ala Ser Gly Ala Tyr Gly Arg
        1125                1130                1135

AGG CTC CTG CCG GCT CCG CCG GCC GCG TCG CGC CGC ACC TGC ACA CCG      34693
Arg Leu Leu Pro Ala Pro Pro Ala Ala Ser Arg Arg Thr Cys Thr Pro
    1140                1145                1150

TCC GGC ACG GTG CTG GTC ACC GGC GGT ACG GGA GCG CTC GGC GGT CAT      34741
Ser Gly Thr Val Leu Val Thr Gly Gly Thr Gly Ala Leu Gly Gly His
1155                1160                1165                1170

CTG GCC CGC CGT CTC GCA CGC GGC GGG ACC GGG CAT CTG GTG CTC ACC      34789
Leu Ala Arg Arg Leu Ala Arg Gly Gly Thr Gly His Leu Val Leu Thr
                1175                1180                1185

AGC CGT CGC GGC CCG GAC GCG CCG GGC GCC GGT GAA CTC GCC GGT GAA      34837
Ser Arg Arg Gly Pro Asp Ala Pro Gly Ala Gly Glu Leu Ala Gly Glu
            1190                1195                1200

CTC GCC TCC CTG GGC GCG AAG GTC ACG GTC GCC GCG TGC GAC ATG GCC      34885
Leu Ala Ser Leu Gly Ala Lys Val Thr Val Ala Ala Cys Asp Met Ala
        1205                1210                1215

GAC CGT GAA GCC GTG CGG GCG CTG CTC GAC GAG CAC CGG CCG ACC GCG      34933
Asp Arg Glu Ala Val Arg Ala Leu Leu Asp Glu His Arg Pro Thr Ala
    1220                1225                1230
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GTG TTC CAC ACG GCG GGC ACG CCC CAC TCG GCG GAG TTC ACG GCG CTG      34981
Val Phe His Thr Ala Gly Thr Pro His Ser Ala Glu Phe Thr Ala Leu
1235                 1240                 1245                 1250

GAC GAG ACG ACG ACG GCC GGG GTG TAC GGC GGG AAG GTC CTG GGT GCC      35029
Asp Glu Thr Thr Thr Ala Gly Val Tyr Gly Gly Lys Val Leu Gly Ala
                1255                 1260                 1265

CGG CAT CTG GAC GAA CTG ACC CGG GAA CTC GGC ATC GGG CTG GAC GCG      35077
Arg His Leu Asp Glu Leu Thr Arg Glu Leu Gly Ile Gly Leu Asp Ala
            1270                 1275                 1280

TTC GTC CTC TTC TCC TCC GGC GCC GCG GTC TGG GGC AGC GGC GGC CAG      35125
Phe Val Leu Phe Ser Ser Gly Ala Ala Val Trp Gly Ser Gly Gly Gln
        1285                 1290                 1295

ACC GCT TAC GGG GCC GCG AAC GCC GCG CTG GAC GCC CTC GCC GAG CGG      35173
Thr Ala Tyr Gly Ala Ala Asn Ala Ala Leu Asp Ala Leu Ala Glu Arg
    1300                 1305                 1310

CGC CGT GCC GCC GGG CTG CCC GCG ACC TCC GTC GCC TGG GGC CTG TGG      35221
Arg Arg Ala Ala Gly Leu Pro Ala Thr Ser Val Ala Trp Gly Leu Trp
1315                 1320                 1325                 1330

GGC GGC GGA GGC ATG GGG GAG GGG GAC GGT GAG GAG TTC CTC AGC CGG      35269
Gly Gly Gly Gly Met Gly Glu Gly Asp Gly Glu Glu Phe Leu Ser Arg
                1335                 1340                 1345

CGC GGC CTC GGC GTG ATG CCG CCG GAG GAC GCG CTG GAA GCC CTG GAC      35317
Arg Gly Leu Gly Val Met Pro Pro Glu Asp Ala Leu Glu Ala Leu Asp
            1350                 1355                 1360

CGG GCC CTG GAC CGG GAG GAC ACC ACC GTC GTG GTG GCG GAT GTC GAC      35365
Arg Ala Leu Asp Arg Glu Asp Thr Thr Val Val Val Ala Asp Val Asp
        1365                 1370                 1375

TGG GAG CGG TTC GCC CCG GCC TTC ACC GCG TTC CGG CCC AGT GCG CTG      35413
Trp Glu Arg Phe Ala Pro Ala Phe Thr Ala Phe Arg Pro Ser Ala Leu
    1380                 1385                 1390

ATC TCC CGG CTG GTC TCG GAC GGC GGG GAG GCG GGG GGG CAG GAC GCC      35461
Ile Ser Arg Leu Val Ser Asp Gly Gly Glu Ala Gly Gly Gln Asp Ala
1395                 1400                 1405                 1410

CCG GAC GGC ACG CTG TTC GCC GCC GGG TTC GCG GCC GCC GGG CCA CTG      35509
Pro Asp Gly Thr Leu Phe Ala Ala Gly Phe Ala Ala Ala Gly Pro Leu
                1415                 1420                 1425

GAG CGG CAG GAG ATG CTG CTC GGC CTG GTG CGC CGG CAT GTG GCC GCC      35557
Glu Arg Gln Glu Met Leu Leu Gly Leu Val Arg Arg His Val Ala Ala
            1430                 1435                 1440

GTA CTC GGC CAC CCG GGG ACC GCG GAC ATC GGT CCC GAC CGT GCT TTC      35605
Val Leu Gly His Pro Gly Thr Ala Asp Ile Gly Pro Asp Arg Ala Phe
        1445                 1450                 1455

AAG GAG CTG GGG TTC AGT TCG GTC ACC GCC GTC GAG CTG GCC GGG CGG      35653
Lys Glu Leu Gly Phe Ser Ser Val Thr Ala Val Glu Leu Ala Gly Arg
    1460                 1465                 1470
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CTG GGC CGG GAG TGC GGA CGG AAG CTG CCG CCG ACG CTG GTC TTC GAC      35701
Leu Gly Arg Glu Cys Gly Arg Lys Leu Pro Pro Thr Leu Val Phe Asp
1475                1480                1485                1490

CAT CCG ACT GCC GCG GCG GCC GTC GAA CAC CTG GCG GAG CTG CTG ACA      35749
His Pro Thr Ala Ala Ala Ala Val Glu His Leu Ala Glu Leu Leu Thr
                1495                1500                1505

CCG CCC GCC GGT CCC GCC GCC GGT CCC CGG GAG GAG GAG GCG CGG GCC      35797
Pro Pro Ala Gly Pro Ala Ala Gly Pro Arg Glu Glu Glu Ala Arg Ala
            1510                1515                1520

GCC CTG GCG CGC GTG CCG CTC GAA CGG CTG AGG GAA GCC GGC CTG CTG      35845
Ala Leu Ala Arg Val Pro Leu Glu Arg Leu Arg Glu Ala Gly Leu Leu
        1525                1530                1535

GAC GCA CTG CTG CGG CTC GCC GCG GAC GAA TCC GGG GCG ACA ACC CCC      35893
Asp Ala Leu Leu Arg Leu Ala Ala Asp Glu Ser Gly Ala Thr Thr Pro
    1540                1545                1550

CGT ACG TCT GCC GCG TCC GGC GCA CCC CGC GGC CGG GAG GAG CCG GAC      35941
Arg Thr Ser Ala Ala Ser Gly Ala Pro Arg Gly Arg Glu Glu Pro Asp
1555                1560                1565                1570

GGC CGC GGC GAG CCG GAC GGC TCG GGA CAC CGC GAA AGC CCG GAC GCG      35989
Gly Arg Gly Glu Pro Asp Gly Ser Gly His Arg Glu Ser Pro Asp Ala
                1575                1580                1585

GCC GGC GGG TCG GAC GCC CTG GAC GAT CTC GAC GGG GAC GCC CTG GTG      36037
Ala Gly Gly Ser Asp Ala Leu Asp Asp Leu Asp Gly Asp Ala Leu Val
            1590                1595                1600

CGG CTC GCC CTC GGG GAA CCG GGC GAG TGA CCGGCCGGCG GAGCACACCC       36087
Arg Leu Ala Leu Gly Glu Pro Gly Glu *
        1605                1610

GGCCGTCTCC GGCCCGGCCG CGGCCGGGCC GGAAGCCATC CGCCGCCCAC CCGGTACCGA   36147

CCCCTCAAGC CCTTCAAGCC CTTCGACCCG TCCGATCAGT CAGTCCGGCG GTCCTCCACG   36207

ACCGGTCCGG AATCGCCCCC ACACGAGTCA GGAAGCACAC C ATG GCC ATG TCC       36260
                                              Met Ala Met Ser
                                              1

GCC GAG AGG CTG ACG GAG GCG CTG CGG ACC TCG CTC AAG GAG GCC GAG      36308
Ala Glu Arg Leu Thr Glu Ala Leu Arg Thr Ser Leu Lys Glu Ala Glu
5                   10                  15                  20

CGG CTC CGG CGG CAG AAC CGC GAA CTG AGG GCC GCG CGG GAC GCG GCG      36356
Arg Leu Arg Arg Gln Asn Arg Glu Leu Arg Ala Ala Arg Asp Ala Ala
                25                  30                  35

CGG GAG CCG ATC GCC GTC GTC GGC ATG GCC TGC CGC TAC CCG GGC GGT      36404
Arg Glu Pro Ile Ala Val Val Gly Met Ala Cys Arg Tyr Pro Gly Gly
            40                  45                  50

GTC ACC GGC CCC GAG GAG CTG TGG GAG CTG GTG GCC GGA GGC CGG GAC      36452
Val Thr Gly Pro Glu Glu Leu Trp Glu Leu Val Ala Gly Gly Arg Asp
        55                  60                  65
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GCG ATC GGG CCG TTC CCC GTG GAC CGG GGC TGG GAC GTG GCG TCG GTG      36500
Ala Ile Gly Pro Phe Pro Val Asp Arg Gly Trp Asp Val Ala Ser Val
    70                  75                  80

TAC GAC CCG GAT CCC GAG TCG AAG GGC ACC ACG TAC TGC CGG GAG GGC      36548
Tyr Asp Pro Asp Pro Glu Ser Lys Gly Thr Thr Tyr Cys Arg Glu Gly
85                  90                  95                  100

GGG TTC CTG GAA GGC GCC GGT GAC TTC GAC GCC GCC TTC TTC GGC ATC      36596
Gly Phe Leu Glu Gly Ala Gly Asp Phe Asp Ala Ala Phe Phe Gly Ile
                105                 110                 115

TCG CCG CGC GAG GCC CTG GTG ATG GAC CCG CAG CAG CGG CTG CTG CTG      36644
Ser Pro Arg Glu Ala Leu Val Met Asp Pro Gln Gln Arg Leu Leu Leu
            120                 125                 130

GAG GTG TCC TGG GAG GCG CTG GAA CGC GCG GGC ATC GAC CCG TCC TCG      36692
Glu Val Ser Trp Glu Ala Leu Glu Arg Ala Gly Ile Asp Pro Ser Ser
        135                 140                 145

CTG CGC GGC AGC CGC GGT GGT GTC TAC GTG GGC GCC GCG CAC GGC TCG      36740
Leu Arg Gly Ser Arg Gly Gly Val Tyr Val Gly Ala Ala His Gly Ser
    150                 155                 160

TAC GCC TCC GAT CCC CGG CTG GTG CCC GAG GGC TCG GAG GGC TAT CTG      36788
Tyr Ala Ser Asp Pro Arg Leu Val Pro Glu Gly Ser Glu Gly Tyr Leu
165                 170                 175                 180

CTG ACC GGC AGC GCC GAC GCG GTG ATG TCC GGC CGC ATC TCC TAC GCG      46836
Leu Thr Gly Ser Ala Asp Ala Val Met Ser Gly Arg Ile Ser Tyr Ala
                185                 190                 195

CTC GGT CTC GAA GGA CCG TCC ATG ACG GTG GAG ACG GCC TGC TCC TCC      36884
Leu Gly Leu Glu Gly Pro Ser Met Thr Val Glu Thr Ala Cys Ser Ser
            200                 205                 210

TCG CTG GTG GCG CTG CAT CTG GCG GTA CGG GCG CTG CGG CAC GGC GAG      36932
Ser Leu Val Ala Leu His Leu Ala Val Arg Ala Leu Arg His Gly Glu
        215                 220                 225

TGC GGG CTC GCG CTG GCG GGC GGG GTG GCG GTG ATG GCC GAT CCG GCG      36980
Cys Gly Leu Ala Leu Ala Gly Gly Val Ala Val Met Ala Asp Pro Ala
    230                 235                 240

GCG TTC GTG GAG TTC TCC CGG CAG AAG GGG CTG GCC GCC GAC GGC CGC      37028
Ala Phe Val Glu Phe Ser Arg Gln Lys Gly Leu Ala Ala Asp Gly Arg
245                 250                 255                 260

TGC AAG GCG TTC TCG GCC GCC GCC GAC GGC ACC GGC TGG GCC GAG GGC      37076
Cys Lys Ala Phe Ser Ala Ala Ala Asp Gly Thr Gly Trp Ala Glu Gly
                265                 270                 275

GTC GGC GTG CTC GTC CTG GAG CGG CTG TCG GAC GCG CGC CGC GCG GGG      37124
Val Gly Val Leu Val Leu Glu Arg Leu Ser Asp Ala Arg Arg Ala Gly
            280                 285                 290

CAC ACG GTC CTC GGC CTG GTC ACC GGC ACC GCG GTC AAC CAG GAC GGT      37172
His Thr Val Leu Gly Leu Val Thr Gly Thr Ala Val Asn Gln Asp Gly
        295                 300                 305
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GCC TCC AAC GGG CTG ACC GCG CCC AAC GGC CCA GCC CAG CAA CGC GTC      37220
Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ala Gln Gln Arg Val
    310                 315                 320

ATC GCC GAG GCG CTC GCC GAC GCC GGG CTG TCC CCG GAG GAC GTG GAC      37268
Ile Ala Glu Ala Leu Ala Asp Ala Gly Leu Ser Pro Glu Asp Val Asp
325                 330                 335                 340

GCG GTC GAG GCG CAC GGC ACC GGC ACC CGG CTC GGC GAC CCC ATC GAG      37316
Ala Val Glu Ala His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu
                345                 350                 355

GCC GGG GCG CTG CTC GCC GCC TCC GGA CGG AAC CGT TCC GGC GAC CAC      37364
Ala Gly Ala Leu Leu Ala Ala Ser Gly Arg Asn Arg Ser Gly Asp His
            360                 365                 370

CCG CTG TGG CTC GGC TCG CTG AAG TCC AAC ATC GGG CAT GCC CAG GCC      37412
Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Ala Gln Ala
        375                 380                 385

GCC GCC GGT GTC GGC GGC GTC ATC AAG ATG CTC CAG GCG CTG CGG CAC      37460
Ala Ala Gly Val Gly Gly Val Ile Lys Met Leu Gln Ala Leu Arg His
    390                 395                 400

GGC TTG CTG CCC CGC ACC CTC CAC GCC GAC GAG CCG ACC CCG CAT GCC      37508
Gly Leu Leu Pro Arg Thr Leu His Ala Asp Glu Pro Thr Pro His Ala
405                 410                 415                 420

GAC TGG AGC TCC GGC CGG GTA CGG CTG CTC ACC TCC GAG GTG CCG TGG      37556
Asp Trp Ser Ser Gly Arg Val Arg Leu Leu Thr Ser Glu Val Pro Trp
                425                 430                 435

CAG CGG ACC GGC CGG CCC CGG CGG ACC GGG GTG TCC GCC TTC GGC GTC      37604
Gln Arg Thr Gly Arg Pro Arg Arg Thr Gly Val Ser Ala Phe Gly Val
            440                 445                 450

GGC GGC ACC AAT GCC CAT GTC GTC CTC GAA GAG GCA CCC GCC CCG CCC      37652
Gly Gly Thr Asn Ala His Val Val Leu Glu Glu Ala Pro Ala Pro Pro
        455                 460                 465

GCG CCG GAA CCG GCC GGG GAG GCC CCC GGC GGC TCC CGC GCC GCA GAA      37700
Ala Pro Glu Pro Ala Gly Glu Ala Pro Gly Gly Ser Arg Ala Ala Glu
    470                 475                 480

GGG GCG GAA GGG CCC CTG GCC TGG GTG GTC TCC GGA CGC GAC GAG CCG      37748
Gly Ala Glu Gly Pro Leu Ala Trp Val Val Ser Gly Arg Asp Glu Pro
485                 490                 495                 500

GCC CTG CGG TCC CAG GCC CGG CGG CTC CGC GAC CAC CTC TCC CGC ACC      37796
Ala Leu Arg Ser Gln Ala Arg Arg Leu Arg Asp His Leu Ser Arg Thr
                505                 510                 515

CCC GGG GCC CGC CCG CGT GAC ATC GCC TTC TCC CTC GCC GCC ACG CGC      37844
Pro Gly Ala Arg Pro Arg Asp Ile Ala Phe Ser Leu Ala Ala Thr Arg
            520                 525                 530

GCA GCC TTT GAC CAC CGC GCC GTG CTG ATC GGC TCG GAC GGG GCC GAA      37892
Ala Ala Phe Asp His Arg Ala Val Leu Ile Gly Ser Asp Gly Ala Glu
        535                 540                 545
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CTC GCC GCC GCC CTG GAC GCG TTG GCC GAA GGA CGC GAC GGT CCG GCG      37940
Leu Ala Ala Ala Leu Asp Ala Leu Ala Glu Gly Arg Asp Gly Pro Ala
    550                 555                 560

GTG GTG CGC GGA GTC CGC GAC CGG GAC GGC AGG ATG GCC TTC CTC TTC      37988
Val Val Arg Gly Val Arg Asp Arg Asp Gly Arg Met Ala Phe Leu Phe
565                 570                 575                 580

ACC GGG CAG GGC AGC CAG CGC GCC GGG ATG GCC CAC GAC CTG CAT GCC      38036
Thr Gly Gln Gly Ser Gln Arg Ala Gly Met Ala His Asp Leu His Ala
                585                 590                 595

GCC CAT ACC TTC TTC GCG TCC GCC CTC GAC GAG GTG ACG GAC CGT CTC      38084
Ala His Thr Phe Phe Ala Ser Ala Leu Asp Glu Val Thr Asp Arg Leu
            600                 605                 610

GAC CCG CTG CTC GGC CGG CCG CTC GGC GCG CTG CTG GAC GCC CGA CCC      38132
Asp Pro Leu Leu Gly Arg Pro Leu Gly Ala Leu Leu Asp Ala Arg Pro
        615                 620                 625

GGC TCG CCC GAA GCG GCA CTC CTG GAC CGG ACC GAG TAC ACC CAG CCG      38180
Gly Ser Pro Glu Ala Ala Leu Leu Asp Arg Thr Glu Tyr Thr Gln Pro
    630                 635                 640

GCG CTC TTC GCC GTC GAG GTG GCG CTC CAC CGG CTG CTG GAG CAC TGG      38228
Ala Leu Phe Ala Val Glu Val Ala Leu His Arg Leu Leu Glu His Trp
645                 650                 655                 660

GGG ATG CGC CCC GAC CTG CTG CTG GGG CAC TCG GTG GGC GAA CTG GCG      38276
Gly Met Arg Pro Asp Leu Leu Leu Gly His Ser Val Gly Glu Leu Ala
                665                 670                 675

GCC GCC CAC GTC GCG GGT GTG CTC GAT CTC GAC GAC GCC TGC GCG CTG      38324
Ala Ala His Val Ala Gly Val Leu Asp Leu Asp Asp Ala Cys Ala Leu
            680                 685                 690

GTG GCC GCC CGC GGC AGG CTG ATG CAG CGC CTG CCG CCC GGC GGC GCG      38372
Val Ala Ala Arg Gly Arg Leu Met Gln Arg Leu Pro Pro Gly Gly Ala
        695                 700                 705

ATG GTC TCC GTG CGG GCC GGC GAG GAC GAG GTC CGC GCA CTG CTG GCC      38420
Met Val Ser Val Arg Ala Gly Glu Asp Glu Val Arg Ala Leu Leu Ala
    710                 715                 720

GGC CGC GAG GAC GCC GTC TGC GTC GCC GCG GTG AAC GGC CCC CGG TCG      38468
Gly Arg Glu Asp Ala Val Cys Val Ala Ala Val Asn Gly Pro Arg Ser
725                 730                 735                 740

GTG GTG ATC TCC GGC GCG GAG GAA GCG GTG GCC GAG GCG GCG GCG CAG      38516
Val Val Ile Ser Gly Ala Glu Glu Ala Val Ala Glu Ala Ala Ala Gln
                745                 750                 755

CTC GCC GGA CGA GGC CGC CGC ACC AGG CGG CTC CGC GTC GCG CAC GCC      38564
Leu Ala Gly Arg Gly Arg Arg Thr Arg Arg Leu Arg Val Ala His Ala
            760                 765                 770

TTC CAC TCA CCC CTG ATG GAC GGC ATG CTC GCC GGA TTC CGG GAG GTC      38612
Phe His Ser Pro Leu Met Asp Gly Met Leu Ala Gly Phe Arg Glu Val
        775                 780                 785
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GCC GCC GGC CTG CGC TAC CGG GAA CCG GAG CTG ACG GTC GTC TCC ACG      38660
Ala Ala Gly Leu Arg Tyr Arg Glu Pro Glu Leu Thr Val Val Ser Thr
    790                 795                 800

GTC ACG GGG CGG CCC GCC CGC CCC GGT GAA CTC ACC GGC CCC GAC TAC      38708
Val Thr Gly Arg Pro Ala Arg Pro Gly Glu Leu Thr Gly Pro Asp Tyr
805                 810                 815                 820

TGG GTG GCC CAG GTC CGT GAG CCC GTG CGC TTC GCG GAC GCG GTC CGC      38756
Trp Val Ala Gln Val Arg Glu Pro Val Arg Phe Ala Asp Ala Val Arg
                825                 830                 835

ACG GCA CAC CGC CTC GGA GCC CGC ACC TTC CTG GAG ACC GGC CCG GAC      38804
Thr Ala His Arg Leu Gly Ala Arg Thr Phe Leu Glu Thr Gly Pro Asp
            840                 845                 850

GGC GTG CTG TGC GGC ATG GCA GAG GAG TGC CTG GAG GAC GAC ACC GTG      38852
Gly Val Leu Cys Gly Met Ala Glu Glu Cys Leu Glu Asp Asp Thr Val
        855                 860                 865

GCC CTG CTG CCG GCG ATC CAC AAG CCC GGC ACC GCG CCG CAC GGT CCG      38900
Ala Leu Leu Pro Ala Ile His Lys Pro Gly Thr Ala Pro His Gly Pro
    870                 875                 880

GCG GCT CCC GGC GCG CTG CGG GCG GCC GCC GCC GCG TAC GGC CGG GGC      38948
Ala Ala Pro Gly Ala Leu Arg Ala Ala Ala Ala Ala Tyr Gly Arg Gly
885                 890                 895                 900

GCC CGG GTG GAC TGG GCC GGG ATG CAC GCC GAC GGC CCC GAG GGG CCG      38996
Ala Arg Val Asp Trp Ala Gly Met His Ala Asp Gly Pro Glu Gly Pro
                905                 910                 915

GCC CGC CGC GTC GAA CTG CCC GTC CAC GCC TTC CGG CAC CGC CGC TAC      39044
Ala Arg Arg Val Glu Leu Pro Val His Ala Phe Arg His Arg Arg Tyr
            920                 925                 930

TGG CTC GCC CCG GGC CGC GCG GCG GAC ACC GAC GAC TGG ATG TAC CGG      39092
Trp Leu Ala Pro Gly Arg Ala Ala Asp Thr Asp Asp Trp Met Tyr Arg
        935                 940                 945

ATC GGC TGG GAC CGG CTG CCG GCT GTG ACC GGC GGG GCC CGG ACC GCC      39140
Ile Gly Trp Asp Arg Leu Pro Ala Val Thr Gly Gly Ala Arg Thr Ala
    950                 955                 960

GGC CGC TGG CTG GTG ATC CAC CCC GAC AGC CCG CGC TGC CGG GAG CTG      39188
Gly Arg Trp Leu Val Ile His Pro Asp Ser Pro Arg Cys Arg Glu Leu
965                 970                 975                 980

TCC GGC CAC GCC GAA CGC GCG CTG CGC GCC GCG GGC GCG AGC CCC GTA      39236
Ser Gly His Ala Glu Arg Ala Leu Arg Ala Ala Gly Ala Ser Pro Val
                985                 990                 995

CCG CTG CCC GTG GAC GCT CCG GCC GCC GAC CGG GCG TCC TTC GCG GCA      39284
Pro Leu Pro Val Asp Ala Pro Ala Ala Asp Arg Ala Ser Phe Ala Ala
            1000                1005                1010

CTG CTG CGC TCC GCC ACC GGA CCT GAC ACA CGA GGT GAC ACA GCC GCG      39332
Leu Leu Arg Ser Ala Thr Gly Pro Asp Thr Arg Gly Asp Thr Ala Ala
        1015                1020                1025
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CCC GTG GCC GGT GTG CTG TCG CTG CTG TCC GAG GAG GAT CGG CCC CAT      39380
Pro Val Ala Gly Val Leu Ser Leu Leu Ser Glu Glu Asp Arg Pro His
    1030                1035                1040

CGC CAG CAC GCC CCG GTA CCC GCC GGG GTC CTG GCG ACG CTG TCC CTG      39428
Arg Gln His Ala Pro Val Pro Ala Gly Val Leu Ala Thr Leu Ser Leu
1045                1050                1055                1060

ATG CAG GCT ATG GAG GAG GAG GCG GTG GAG GCT CGC GTG TGG TGC GTC      39476
Met Gln Ala Met Glu Glu Glu Ala Val Glu Ala Arg Val Trp Cys Val
                1065                1070                1075

TCC CGC GCC GCG GTC GCC GCC GCC GAC CGG GAA CGG CCC GTC GGC GCG      39524
Ser Arg Ala Ala Val Ala Ala Ala Asp Arg Glu Arg Pro Val Gly Ala
            1080                1085                1090

GGC GCC GCC CTG TGG GGG CTG GGG CGG GTG GCC GCC CTG GAA CGC CCC      39572
Gly Ala Ala Leu Trp Gly Leu Gly Arg Val Ala Ala Leu Glu Arg Pro
        1095                1100                1105

ACC CGG TGG GGC GGT CTC GTG GAC CTG CCC GCC TCG CCC GGT GCG GCG      39620
Thr Arg Trp Gly Gly Leu Val Asp Leu Pro Ala Ser Pro Gly Ala Ala
    1110                1115                1120

CAC TGG GCG GCC GCC GTG GAA CGG CTC GCC GGT CCC GAG GAC CAG ATC      39668
His Trp Ala Ala Ala Val Glu Arg Leu Ala Gly Pro Glu Asp Gln Ile
1125                1130                1135                1140

GCC GTG CGC GCG TCC GGC AGT TGG GGC CGG CGC CTC ACC AGG CTG CCG      39716
Ala Val Arg Ala Ser Gly Ser Trp Gly Arg Arg Leu Thr Arg Leu Pro
                1145                1150                1155

CGC GAC GGC GGC GGC CGG ACG GCC GCA CCC GCG TAC CGG CCG CGC GGC      39764
Arg Asp Gly Gly Gly Arg Thr Ala Ala Pro Ala Tyr Arg Pro Arg Gly
            1160                1165                1170

ACG GTG CTC GTC ACC GGT GGC ACC GGC GCG CTC GGC GGG CAT CTC GCC      39812
Thr Val Leu Val Thr Gly Gly Thr Gly Ala Leu Gly Gly His Leu Ala
        1175                1180                1185

CGC TGG CTC GCC GCG GCG GGC GCC GAA CAC CTG GCG CTC ACC AGC CGC      39860
Arg Trp Leu Ala Ala Ala Gly Ala Glu His Leu Ala Leu Thr Ser Arg
    1190                1195                1200

CGG GGC CCG GAC GCG CCC GGC GCC GCC GGA CTC GAG GCC GAA CTC CTC      39908
Arg Gly Pro Asp Ala Pro Gly Ala Ala Gly Leu Glu Ala Glu Leu Leu
1205                1210                1215                1220

CTC CTG GGC GCC AAG GTG ACG TTC GCC GCC TGC GAC ACC GCC GAC CGC      39956
Leu Leu Gly Ala Lys Val Thr Phe Ala Ala Cys Asp Thr Ala Asp Arg
                1225                1230                1235

GAC GGC CTC GCC CGG GTC CTG CGG GCG ATA CCG GAG GAC ACC CCG CTC      40004
Asp Gly Leu Ala Arg Val Leu Arg Ala Ile Pro Glu Asp Thr Pro Leu
            1240                1245                1250

ACC GCG GTG TTC CAC GCC GCG GGC GTA CCG CAG GTC ACG CCG CTG TCC      40052
Thr Ala Val Phe His Ala Ala Gly Val Pro Gln Val Thr Pro Leu Ser
        1255                1260                1265
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CGT ACC TCG CCC GAG CAC TTC GCC GAC GTG TAC GCG GGC AAG GCG GCG      40100
Arg Thr Ser Pro Glu His Phe Ala Asp Val Tyr Ala Gly Lys Ala Ala
    1270                1275                1280

GGC GCC GCG CAC CTG GAC GAA CTG ACC CGC GAA CTC GGC GCC GGA CTC      40148
Gly Ala Ala His Leu Asp Glu Leu Thr Arg Glu Leu Gly Ala Gly Leu
1285                1290                1295                1300

GAC GCG TTC GTC CTC TAC TCC TCC GGC GCC GGC GTC TGG GGC AGC GCC      40196
Asp Ala Phe Val Leu Tyr Ser Ser Gly Ala Gly Val Trp Gly Ser Ala
                1305                1310                1315

GGC CAG GGT GCC TAC GCC GCC GCC AAC GCC GCC CTG GAC GCG CTC GCC      40244
Gly Gln Gly Ala Tyr Ala Ala Ala Asn Ala Ala Leu Asp Ala Leu Ala
            1320                1325                1330

CGG CGC CGT GCG GCG GAC GGA CTC CCC GCC ACC TCC ATC GCC TGG GGC      40292
Arg Arg Arg Ala Ala Asp Gly Leu Pro Ala Thr Ser Ile Ala Trp Gly
        1335                1340                1345

GTG TGG GGC GGC GGC GGT ATG GGG GCC GAC GAG GCG GGC GCG GAG TAT      40340
Val Trp Gly Gly Gly Gly Met Gly Ala Asp Glu Ala Gly Ala Glu Tyr
    1350                1355                1360

CTG GGC CGG CGC GGT ATG CGC CCC ATG GCA CCG GTC TCC GCG CTC CGG      40388
Leu Gly Arg Arg Gly Met Arg Pro Met Ala Pro Val Ser Ala Leu Arg
1365                1370                1375                1380

GCG ATG GCC ACC GCC ATC GCC TCC GGG GAA CCC TGC CCC ACC GTC ACC      40436
Ala Met Ala Thr Ala Ile Ala Ser Gly Glu Pro Cys Pro Thr Val Thr
                1385                1390                1395

CAC ACC GAC TGG GAG CGC TTC GGC GAG GGC TTC ACC GCC TTC CGG CCC      40484
His Thr Asp Trp Glu Arg Phe Gly Glu Gly Phe Thr Ala Phe Arg Pro
            1400                1405                1410

AGC CCT CTG ATC GCG GGG CTC GGC ACG CCG GGC GGC GGC CGG GCG GCG      40532
Ser Pro Leu Ile Ala Gly Leu Gly Thr Pro Gly Gly Gly Arg Ala Ala
        1415                1420                1425

GAG ACC CCC GAG GAG GGG AAC GCC ACC GCT GCG GCG GAC CTC ACC GCC      40580
Glu Thr Pro Glu Glu Gly Asn Ala Thr Ala Ala Ala Asp Leu Thr Ala
    1430                1435                1440

CTG CCG CCC GCC GAA CTC CGC ACC GCG CTG CGC GAG CTG GTG CGA GCC      40628
Leu Pro Pro Ala Glu Leu Arg Thr Ala Leu Arg Glu Leu Val Arg Ala
1445                1450                1455                1460

CGG ACC GCC GCG GCG CTC GGC CTC GAC GAC CCG GCC GAG GTC GCC GAG      40676
Arg Thr Ala Ala Ala Leu Gly Leu Asp Asp Pro Ala Glu Val Ala Glu
                1465                1470                1475

GGC GAA CGG TTC CCC GCC ATG GGC TTC GAC TCC CTG GCC ACC GTA CGG      40724
Gly Glu Arg Phe Pro Ala Met Gly Phe Asp Ser Leu Ala Thr Val Arg
            1480                1485                1490

CTG CGC CGC GGA CTC GCC TCG GCC ACG GGC CTC GAC CTG CCC CCC GAT      40772
Leu Arg Arg Gly Leu Ala Ser Ala Thr Gly Leu Asp Leu Pro Pro Asp
        1495                1500                1505
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CTG CTC TTC GAC CGG GAC ACC CCG GCC GCG CTC GCC GCC CAC CTG GCC      40820
Leu Leu Phe Asp Arg Asp Thr Pro Ala Ala Leu Ala Ala His Leu Ala
    1510                1515                1520

GAA CTG CTC GCC ACC GCA CGG GAC CAC GGA CCC GGC GGC CCC GGG ACC      40868
Glu Leu Leu Ala Thr Ala Arg Asp His Gly Pro Gly Gly Pro Gly Thr
1525                1530                1535                1540

GGT GCC GCG CCG GCC GAT GCC GGA AGC GGC CTG CCG GCC CTC TAC CGG      40916
Gly Ala Ala Pro Ala Asp Ala Gly Ser Gly Leu Pro Ala Leu Tyr Arg
                1545                1550                1555

GAG GCC GTC CGC ACC GGC CGG GCC GCG GAA ATG GCC GAA CTG CTC GCC      40964
Glu Ala Val Arg Thr Gly Arg Ala Ala Glu Met Ala Glu Leu Leu Ala
            1560                1565                1570

GCC GCT TCC CGG TTC CGC CCC GCC TTC GGG ACG GCG GAC CGG CAG CCG      41012
Ala Ala Ser Arg Phe Arg Pro Ala Phe Gly Thr Ala Asp Arg Gln Pro
        1575                1580                1585

GTG GCC CTC GTG CCG CTG GCC GAC GGC GCG GAG GAC ACC GGG CTC CCG      41060
Val Ala Leu Val Pro Leu Ala Asp Gly Ala Glu Asp Thr Gly Leu Pro
    1590                1595                1600

CTG CTC GTG GGC TGC GCC GGG ACG GCG GTG GCC TCC GGC CCG GTG GAG      41108
Leu Leu Val Gly Cys Ala Gly Thr Ala Val Ala Ser Gly Pro Val Glu
1605                1610                1615                1620

TTC ACC GCC TTC GCC GGA GCG CTG GCG GAC CTC CCG GCG GCG GCC CCG      41156
Phe Thr Ala Phe Ala Gly Ala Leu Ala Asp Leu Pro Ala Ala Ala Pro
                1625                1630                1635

ATG GCC GCG CTG CCG CAG CCC GGC TTT CTG CCG GGA GAA CGA GTC CCG      41204
Met Ala Ala Leu Pro Gln Pro Gly Phe Leu Pro Gly Glu Arg Val Pro
            1640                1645                1650

GCC ACC CCG GAG GCA TTG TTC GAG GCC CAG GCG GAA GCG CTG CTG CGC      41252
Ala Thr Pro Glu Ala Leu Phe Glu Ala Gln Ala Glu Ala Leu Leu Arg
        1655                1660                1665

TAC GCG GCC GGC CGG CCC TTC GTG CTG CTG GGG CAC TCC GCC GGC GCC      41300
Tyr Ala Ala Gly Arg Pro Phe Val Leu Leu Gly His Ser Ala Gly Ala
    1670                1675                1680

AAC ATG GCC CAC GCC CTG ACC CGT CAT CTG GAG GCG AAC GGT GGC GGC      41348
Asn Met Ala His Ala Leu Thr Arg His Leu Glu Ala Asn Gly Gly Gly
1685                1690                1695                1700

CCC GCA GGG CTG GTG CTC ATG GAC ATC TAC ACC CCC GCC GAC CCC GGC      41396
Pro Ala Gly Leu Val Leu Met Asp Ile Tyr Thr Pro Ala Asp Pro Gly
                1705                1710                1715

GCG ATG GGC GTC TGG CGG AAC GAC ATG TTC CAG TGG GTC TGG CGG CGC      41444
Ala Met Gly Val Trp Arg Asn Asp Met Phe Gln Trp Val Trp Arg Arg
            1720                1725                1730

TCG GAC ATC CCC CCG GAC GAC CAC CGC CTC ACG GCC ATG GGC GCC TAC      41492
Ser Asp Ile Pro Pro Asp Asp His Arg Leu Thr Ala Met Gly Ala Tyr
        1735                1740                1745
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CAC CGG CTG CTT CTC GAC TGG TCG CCC ACC CCC GTC CGC GCC CCC GTA      41540
His Arg Leu Leu Leu Asp Trp Ser Pro Thr Pro Val Arg Ala Pro Val
    1750                1755                1760

CTG CAT CTG CGC GCC GCG GAA CCC ATG GGC GAC TGG CCA CCC GGG GAC      41588
Leu His Leu Arg Ala Ala Glu Pro Met Gly Asp Trp Pro Pro Gly Asp
1765                1770                1775                1780

ACC GGC TGG CAG TCC CAC TGG GAC GGC GCG CAC ACC ACC GCC GGC ATC      41636
Thr Gly Trp Gln Ser His Trp Asp Gly Ala His Thr Thr Ala Gly Ile
                1785                1790                1795

CCC GGA AAC CAC TTC ACG ATG ATG ACC GAA CAC GCC TCC GCC GCC GCC      41684
Pro Gly Asn His Phe Thr Met Met Thr Glu His Ala Ser Ala Ala Ala
            1800                1805                1810

CGG CTC GTG CAC GGC TGG CTC GCG GAA CGG ACC CCG TCC GGG CAG GGC      41732
Arg Leu Val His Gly Trp Leu Ala Glu Arg Thr Pro Ser Gly Gln Gly
        1815                1820                1825

GGG TCA CCG TCC CGC GCG GCG GGG AGA GAG GAG AGG CCG TGA              41774
Gly Ser Pro Ser Arg Ala Ala Gly Arg Glu Glu Arg Pro *
    1830                1835                1840

ACACGGCAGC CGGCCCGACC GGCACCGCCG CCGGCGGCAC CACCGCCCCG GCGGCGGCAC   41834

ACGACCTGTC CCGCGCCGGA CGCAGGCTCC AACTCACCCG GGCCGCACAG TGGTTCGCCG   41894

GCAACCAGGG AGACCCCTAC GGGATGATCC TGCGCGCCGG CACCGCCGAC CCGGCACCGT   41954

ACGAGGAAGA GATCCGTGAG CGGGGGCCGC TGTTCCACAG CGAACTCCTC GGCGCCTGGG   42014

TGACCGGCAG CCGCCATGTC GCCGACGCCG TGACGGCCGA CGACGCGTTC GGCGCCCTCA   42074

CCGCGGACGG TGCACGGCCA GGAGTCCGCG AACTGCCGCT CTCCGGCAGC GCCCTCGACG   42134

CCGCCCACGG GAACCCCGGC GGCCCGCCCC TCCCCGGAGG GTGGCCGCAC CGGCCCCCGG   42194

ACAGGGAGGA GCGAGACGAC CCGGACCGGC ACGCGGCGGA CCTGCTGAAC GCCGCCGGCC   42254

CGGGGCAGGT CCTCGACCTC GTCCCGTTCG CCCGGCGGCT GGCGGCCCGG ACGGCCGGCG   42314

CGTGGCTGGG CGTCCCGGCG GAACGGCTGC CGCGCTTCGA GACGGCACTC ACCGGCTGCC   42374

GCCGCGCCCT CGACGCCCTG CTCTGCCCCC AGCTCCTGGC CGACGCGCGG GCCGGACTGG   42434

CCGCCGAGGA GGCCCTGCGC GCCGTGCTCG GCGAGACCCC GGAGGCACGC GGACGTCCGC   42494

CCGGCGCGGT CGAGGCGGCC CGCGCGCACG CCGTCAGCGC GGCGGAGCCC ATCGCCGTCC   42554

TGCTGTGCAA CGCGGTGCGG GAACTGATGG AACGGCCGGC CCAGTGGCGG GCGCTCACCG   42614

CCGACCCCGG CCTGGCGGGC GCCGCGATCA CCGAAACACT GCTCTGGGCA CCGCCGGTGC   42674

GCCTGGAGAG CAGGGTGGCA CGCGAGACGG CCGTACTCGC CGGGCGGACG CTGCCCGCTG   42734

GAACCCATCT CGTCGTCCTC GCCGCCGCCG CCAACCGCGA CGCCTGCCGG AACGCCGGTC   42794

CGGCCGTCAC CGGCTTCGAC GTCCTCCGCC GCGCCTCGGA CGGCGGCCCC CAGCCCCACG   42854
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GACTCCCGGA GGACCTGCAC TTCCGTCTCT CGGGCCCGCT CGTCCGGCGG ACCGCCGAGG 42914

CCGGTCTGAG GGCGCTCGCC GAACGCTTCC CCGGCTGCGC CCGGCCGGCC CCGCAGTCCG 42974

AGTCCGCCGG TCACCGGTGC TCCGCGGTCT CGGCCGGCTG CCCGTCGCCC CGTATGTCCC 43034

CGAGTGAGAA GGGCACTGGA TGACCGCCGC CGAGGACCGC ACGGACCGGA AGGGAAACCG 43094

CCGATGCGCG TACTGCTGAC CTGTATCGCG CACAACACCC ACTACTACAA CCTGGTGCCG 43154

GTCGCCTGGG CCCTGAGAGC GGCCGGACAC GAGGTGCGGG TGGCCGCGCA GCCCGCCCTC 43214

ACCGACACGA TCACCGCCTC CGGACTGACC GCCGTGCCGG TCGGCGGCAA CGAGTCCGTG 43274

CTCGAG 43280

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 4473 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Met Ser Ser Ala Leu Arg Arg Ala Val Gln Ser Asn Cys Gly Tyr Gly
1 5 10 15

Asp Leu Met Thr Ser Asn Thr Ala Ala Gln Asn Thr Gly Asp Gln Glu
20 25 30

Asp Val Asp Gly Pro Asp Ser Thr His Gly Gly Glu Ile Ala Val Val
35 40 45

Gly Met Ser Cys Arg Leu Pro Gly Ala Ala Gly Val Glu Glu Phe Trp
50 55 60

Glu Leu Leu Arg Ser Gly Arg Gly Met Pro Thr Arg Gln Asp Asp Gly
65 70 75 80

Thr Trp Arg Ala Ala Leu Glu Asp His Ala Gly Phe Asp Ala Gly Phe
85 90 95

Phe Gly Met Asn Ala Arg Gln Ala Ala Ala Thr Asp Pro Gln His Arg
100 105 110

Leu Met Leu Glu Leu Gly Trp Glu Ala Leu Glu Asp Ala Gly Ile Val
115 120 125

Pro Gly Asp Leu Thr Gly Thr Asp Thr Gly Val Phe Ala Gly Val Ala
130 135 140

Ser Asp Asp Tyr Ala Val Leu Thr Arg Arg Ser Ala Val Ser Ala Gly
145 150 155 160

Gly Tyr Thr Ala Thr Gly Leu His Arg Ala Leu Ala Ala Asn Arg Leu
165 170 175

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Ser His Phe Leu Gly Leu Arg Gly Pro Ser Leu Val Val Asp Ser Ala
            180                 185                 190

Gln Ser Ala Ser Leu Val Ala Val Gln Leu Ala Cys Glu Ser Leu Arg
        195                 200                 205

Arg Gly Glu Thr Ser Leu Ala Val Ala Gly Gly Val Asn Leu Ile Leu
    210                 215                 220

Thr Glu Glu Ser Thr Thr Val Met Glu Arg Met Gly Ala Leu Ser Pro
225                 230                 235                 240

Asp Gly Arg Cys His Thr Phe Asp Ala Arg Ala Asn Gly Tyr Val Arg
                245                 250                 255

Gly Glu Gly Gly Gly Ala Val Val Leu Lys Pro Leu Asp Ala Ala Leu
            260                 265                 270

Ala Asp Gly Asp Arg Val Tyr Cys Val Ile Lys Gly Gly Ala Val Asn
        275                 280                 285

Asn Asp Gly Gly Gly Ala Ser Leu Thr Thr Pro Asp Arg Glu Ala Gln
    290                 295                 300

Glu Ala Val Leu Arg Gln Ala Tyr Arg Arg Ala Gly Val Ser Thr Gly
305                 310                 315                 320

Ala Val Arg Tyr Val Glu Leu His Gly Thr Gly Thr Arg Ala Gly Asp
                325                 330                 335

Pro Val Glu Ala Ala Ala Leu Gly Ala Val Leu Gly Ala Gly Ala Asp
            340                 345                 350

Ser Gly Arg Ser Thr Pro Leu Ala Val Gly Ser Val Lys Thr Asn Val
        355                 360                 365

Gly His Leu Glu Gly Ala Ala Gly Ile Val Gly Leu Ile Lys Ala Thr
    370                 375                 380

Leu Cys Val Arg Lys Gly Glu Leu Val Pro Ser Leu Asn Phe Ser Thr
385                 390                 395                 400

Pro Asn Pro Asp Ile Pro Leu Asp Asp Leu Arg Leu Arg Val Gln Thr
                405                 410                 415

Glu Arg Gln Glu Trp Asn Glu Glu Asp Asp Arg Pro Arg Val Ala Gly
            420                 425                 430

Val Ser Ser Phe Gly Met Gly Gly Thr Asn Val His Leu Val Ile Ala
        435                 440                 445

Glu Ala Pro Ala Ala Ala Gly Ser Ser Gly Ala Gly Gly Ser Gly Ala
    450                 455                 460

Gly Ser Gly Ala Gly Ile Ser Ala Val Ser Gly Val Val Pro Val Val
465                 470                 475                 480

Val Ser Gly Arg Ser Arg Val Val Val Arg Glu Ala Ala Gly Arg Leu
                485                 490                 495
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Ala Glu Val Val Glu Ala Gly Gly Val Gly Leu Ala Asp Val Ala Val
500 505 510

Thr Met Ala Asp Arg Ser Arg Phe Gly Tyr Arg Ala Val Val Leu Ala
515 520 525

Arg Gly Glu Ala Glu Leu Ala Gly Arg Leu Arg Ala Leu Ala Gly Gly
530 535 540

Asp Pro Asp Ala Gly Val Val Thr Gly Ala Val Leu Asp Gly Gly Val
545 550 555 560

Val Val Gly Ala Ala Pro Gly Gly Ala Gly Ala Ala Gly Gly Ala Gly
565 570 575

Ala Ala Gly Gly Ala Gly Gly Gly Gly Val Val Leu Val Phe Pro Gly
580 585 590

Gln Gly Thr Gln Trp Val Gly Met Gly Ala Gly Leu Leu Gly Ser Ser
595 600 605

Glu Val Phe Ala Ala Ser Met Arg Glu Cys Ala Arg Ala Leu Ser Val
610 615 620

His Val Gly Trp Asp Leu Leu Glu Val Val Ser Gly Gly Ala Gly Leu
625 630 635 640

Glu Arg Val Asp Val Val Gln Pro Val Thr Trp Ala Val Met Val Ser
645 650 655

Leu Ala Arg Tyr Trp Gln Ala Met Gly Val Asp Val Ala Ala Val Val
660 665 670

Gly His Ser Gln Gly Glu Ile Ala Ala Ala Thr Val Ala Gly Ala Leu
675 680 685

Ser Leu Glu Asp Ala Ala Ala Val Val Ala Leu Arg Ala Gly Leu Ile
690 695 700

Gly Arg Tyr Leu Ala Gly Arg Gly Ala Met Ala Ala Val Pro Leu Pro
705 710 715 720

Ala Gly Glu Val Glu Ala Gly Leu Ala Lys Trp Pro Gly Val Glu Val
725 730 735

Ala Ala Val Asn Gly Pro Ala Ser Thr Val Val Ser Gly Asp Arg Arg
740 745 750

Ala Val Ala Gly Tyr Val Ala Val Cys Gln Ala Glu Gly Val Gln Ala
755 760 765

Arg Leu Ile Pro Val Asp Tyr Ala Ser His Ser Arg His Val Glu Asp
770 775 780

Leu Lys Gly Glu Leu Glu Arg Val Leu Ser Gly Ile Arg Pro Arg Ser
785 790 795 800

Pro Arg Val Pro Val Cys Ser Thr Val Ala Gly Glu Gln Pro Gly Glu
805 810 815

Pro Val Phe Asp Ala Gly Tyr Trp Phe Arg Asn Leu Arg Asn Arg Val
820 825 830

Glu Phe Ser Ala Val Val Gly Gly Leu Leu Glu Glu Gly His Arg Arg
835 840 845

Phe Ile Glu Val Ser Ala His Pro Val Leu Val His Ala Ile Glu Gln
850 855 860

Thr Ala Glu Ala Ala Asp Arg Ser Val His Ala Thr Gly Thr Leu Arg
865 870 875 880

Arg Gln Asp Asp Ser Pro His Arg Leu Leu Thr Ser Thr Ala Glu Ala
885 890 895

Trp Ala His Gly Ala Thr Leu Thr Trp Asp Pro Ala Leu Pro Pro Gly
900 905 910

His Leu Thr Thr Leu Pro Thr Tyr Pro Phe Asn His His His Tyr Trp
915 920 925

Leu Asp Thr Ile Asp Gly Gly Gly Gly Asp Asp Ala Thr Gln Glu Lys
930 935 940

Glu Ser Gly Pro Leu Thr Arg Glu Leu Arg Gly Leu Pro Ser Ser Gln
945 950 955 960

Lys Gln Leu Gly Phe Leu Leu Asp Leu Val Cys Arg His Thr Ala Val
965 970 975

Val Leu Gly Leu Asp Thr Ala Ala Glu Val Asp Pro Asp Leu Ser Phe
980 985 990

Lys Lys Gln Gly Ile Gln Ser Met Thr Gly Val Glu Leu Arg Asn Arg
995 1000 1005

Leu Leu Thr Glu Thr Gly Leu Ala Leu Pro Thr Thr Leu Val Tyr Asp
1010 1015 1020

Arg Pro Thr Pro Arg Ala Leu Ala Gln Phe Leu His Thr Glu Leu Leu
1025 1030 1035 1040

Asp Gly Ser Pro Ser Gly Ser Val Leu Ala Pro Ala Gln Lys Ser Phe
1045 1050 1055

Glu Ala Gln Glu Pro Ile Ala Val Val Gly Met Gly Cys Arg Phe Pro
1060 1065 1070

Gly Gly Val Gly Ser Pro Glu Ala Leu Trp Arg Leu Val Val Glu Gly
1075 1080 1085

Val Asp Ala Val Ser Pro Phe Pro Gly Asp Arg Gly Trp Asp Val Glu
1090 1095 1100

Gly Leu Tyr Asp Pro Glu Pro Gly Val Ala Gly Lys Ser Tyr Val Arg
1105 1110 1115 1120

Glu Gly Gly Phe Leu His Asp Ala Ala Glu Phe Asp Ala Glu Phe Phe
1125 1130 1135

Gly Ile Ser Pro Arg Glu Ala Val Ala Met Asp Pro Gln Gln Arg Leu
1140 1145 1150

Leu Leu Glu Thr Ser Trp Glu Ala Ile Glu Arg Ala Gly Ile Asp Pro
1155 1160 1165

His Ser Leu His Gly Ser Arg Thr Gly Val Tyr Ala Gly Val Met Pro
1170 1175 1180

Gln Glu Tyr Gly Pro Arg Leu Ala Glu Gly Ala Glu Gly Ser Asp Gly
1185 1190 1195 1200

Tyr Leu Leu Thr Gly Thr Ser Gly Ser Val Val Ser Gly Arg Val Ala
1205 1210 1215

Tyr Thr Leu Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys
1220 1225 1230

Ser Ser Ser Leu Val Ala Leu His Leu Ala Val Gln Ala Leu Arg Gly
1235 1240 1245

Gly Glu Cys Asp Met Ala Leu Ala Gly Gly Val Thr Val Met Ala Gly
1250 1255 1260

Pro Gly Met Phe Val Glu Phe Ser Arg Gln Arg Gly Leu Ala Ala Asp
1265 1270 1275 1280

Gly Arg Cys Lys Ala Phe Ala Asp Gly Ala Asp Gly Thr Ala Trp Ala
1285 1290 1295

Glu Gly Ala Gly Val Val Leu Val Glu Arg Leu Ser Asp Ala Arg Arg
1300 1305 1310

Leu Gly His Pro Val Leu Ala Val Val Cys Gly Ser Ala Val Asn Gln
1315 1320 1325

Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Ser Gly Pro Ser Gln Glu
1330 1335 1340

Arg Val Ile Arg Gln Ala Leu Gly Asn Ala Arg Leu Thr Val Ala Asp
1345 1350 1355 1360

Val Asp Val Val Glu Ala His Gly Thr Gly Thr Arg Leu Gly Asp Pro
1365 1370 1375

Ile Glu Ala Gln Ala Leu Leu Gly Thr Tyr Gly Arg Asp Arg Asp Gly
1380 1385 1390

Gly Arg Pro Val Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Ala
1395 1400 1405

Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys Met Val Leu Ala Met
1410 1415 1420

Arg Tyr Gly Trp Leu Pro Arg Thr Leu His Val Asp Glu Pro Ser Arg
1425 1430 1435 1440

His Val Asp Trp Ser Ala Gly Gly Val Trp Leu Leu Thr Glu Ala Arg
1445 1450 1455

Glu Trp Pro Gly Val Asp Arg Pro Arg Arg Ala Ala Val Ser Ala Phe
1460 1465 1470

Gly Val Ser Gly Thr Asn Ala His Leu Ile Leu Glu Ala Pro Asp Thr
1475 1480 1485

Ala Glu Ala Glu Ser Ala Thr Thr Pro Val Arg Ser Glu Val Ser Glu
1490 1495 1500

Ser Ala Ala Val Leu Asp Ala Arg Ser Gly Val Val Pro Val Val Val
1505 1510 1515 1520

Ser Gly Arg Ser Arg Val Val Val Arg Glu Ala Ala Gly Arg Leu Ala
1525 1530 1535

Glu Val Val Glu Ala Gly Gly Val Gly Leu Ala Asp Val Ala Val Thr
1540 1545 1550

Met Ala Gly Arg Ser Arg Phe Gly Tyr Arg Ala Val Val Leu Ala Arg
1555 1560 1565

Gly Glu Ala Glu Leu Ala Gly Arg Leu Arg Ala Leu Ala Gly Gly Asp
1570 1575 1580

Pro Asp Ala Gly Val Val Thr Gly Ala Val Val Asp Pro Glu Thr Gly
1585 1590 1595 1600

Ser Gly Gly Gly Gly Val Val Leu Val Phe Pro Gly Gln Gly Thr Gln
1605 1610 1615

Trp Val Gly Met Gly Ala Gly Leu Leu Gly Ser Ser Glu Val Phe Ala
1620 1625 1630

Ala Ser Met Arg Glu Cys Ala Arg Ala Leu Ser Val His Val Glu Trp
1635 1640 1645

Asp Leu Leu Glu Val Val Ser Gly Gly Ala Gly Leu Glu Arg Val Asp
1650 1655 1660

Val Val Gln Pro Val Thr Trp Ala Val Met Val Ser Leu Ala Arg Tyr
1665 1670 1675 1680

Trp Gln Ala Met Gly Val Asp Val Ala Ala Val Val Gly His Ser Gln
1685 1690 1695

Gly Glu Ile Ala Ala Ala Thr Val Ala Gly Ala Leu Ser Leu Glu Asp
1700 1705 1710

Ala Ala Ala Val Val Ala Leu Arg Ala Gly Leu Ile Gly Arg Tyr Leu
1715 1720 1725

Ala Gly Arg Gly Ala Met Ala Ala Val Pro Leu Pro Ala Gly Glu Val
1730 1735 1740

Glu Ala Gly Leu Ala Lys Trp Pro Gly Val Glu Val Ala Ala Val Asn
1745 1750 1755 1760

Gly Pro Ala Ser Thr Val Val Ser Gly Asp Arg Arg Ala Val Ala Gly
1765 1770 1775

Tyr Val Ala Val Cys Gln Ala Glu Gly Val Gln Ala Arg Leu Ile Pro
1780 1785 1790

Val Asp Tyr Ala Ser His Ser Arg His Val Glu Asp Leu Lys Gly Glu
1795 1800 1805

Leu Glu Arg Val Leu Ser Gly Ile Arg Pro Arg Ser Pro Arg Val Pro
1810 1815 1820

Val Cys Ser Thr Val Ala Gly Glu Gln Pro Gly Glu Pro Val Phe Asp
1825 1830 1835 1840

Ala Gly Tyr Trp Phe Arg Asn Leu Arg Asn Arg Val Glu Phe Ser Ala
1845 1850 1855

Val Val Gly Gly Leu Leu Glu Glu Gly His Arg Arg Phe Ile Glu Val
1860 1865 1870

Ser Ala His Pro Val Leu Val His Ala Ile Glu Gln Thr Ala Glu Ala
1875 1880 1885

Ala Asp Arg Ser Val His Ala Thr Gly Thr Leu Arg Arg Gln Asp Asp
1890 1895 1900

Ser Pro His Arg Leu Leu Thr Ser Thr Ala Glu Ala Trp Ala His Gly
1905 1910 1915 1920

Ala Thr Leu Thr Trp Asp Pro Ala Leu Pro Pro Gly His Leu Thr Thr
1925 1930 1935

Leu Pro Thr Tyr Pro Phe Asn His His His Tyr Trp Leu Asp Thr Thr
1940 1945 1950

Pro Thr Thr Pro Ala Thr Thr Thr Gln Ser Pro Thr Asp Ala Trp Arg
1955 1960 1965

Tyr Arg Val Thr Trp Lys Ala Leu Thr Glu Ser Ser Pro Val Arg Pro
1970 1975 1980

His Ser Ile Gly Arg Cys Leu Leu Val Ala Pro Pro Thr Thr Asp Gly
1985 1990 1995 2000

Glu Leu Leu Asp Gly Leu Thr Thr Val Leu Ser Glu Arg Gly Ala Ser
2005 2010 2015

Val Ala Arg Leu Glu Val Pro Ile Gly Ala Arg Arg Ala Glu Val Ala
2020 2025 2030

Glu Leu Leu Lys Pro Ser Met Glu Ser Ala Gly Glu Glu Asn Thr Thr
2035 2040 2045

Val Val Ser Leu Leu Gly Leu Val Pro Ser Thr Asp Ala Val Arg Thr
2050 2055 2060

Ser Ile Ala Leu Leu Gln Ala Val Ser Asp Ile Gly Val Pro Ala Ala
2065 2070 2075 2080

Arg Val Trp Ala Leu Thr Arg Arg Ala Val Ala Val Val Pro Gly Glu
2085 2090 2095

Thr Pro Gln Asp Ala Gly Ala Gln Leu Trp Gly Phe Gly Arg Val Ala
2100 2105 2110

Ala Leu Glu Leu Pro Asp Ile Trp Gly Gly Leu Ile Asp Leu Pro Glu
2115 2120 2125

Thr Ala Glu Leu Thr Arg Thr Pro Glu Thr Ser Gln Pro Pro Gln Thr
2130 2135 2140

Pro Glu Arg Leu Pro Gln Thr Pro Asn Arg Arg Ala Leu Glu Leu Ala
2145 2150 2155 2160

Ala Ala Val Leu Ala Gly Arg Asp Gly Glu Asp Gln Val Ala Val Arg
2165 2170 2175

Ala Ser Gly Ile Tyr Gly Arg Arg Val Ser Arg Ala Ala Ala Ala Gly
2180 2185 2190

Ala Ala Ser Trp Gln Pro Ser Gly Thr Val Leu Ile Thr Gly Gly Met
2195 2200 2205

Gly Ala Ile Gly Arg Arg Leu Ala Arg Arg Leu Ala Ala Glu Gly Ala
2210 2215 2220

Glu Arg Leu Val Leu Thr Ser Arg Arg Gly Pro Glu Ala Pro Gly Ala
2225 2230 2235 2240

Ala Glu Leu Ala Glu Glu Leu Arg Gly His Gly Cys Glu Val Val His
2245 2250 2255

Ala Ala Cys Asp Val Ala Glu Arg Asp Ala Leu Ala Ala Leu Val Thr
2260 2265 2270

Ala Tyr Pro Pro Asn Ala Val Phe His Thr Ala Gly Ile Leu Asp Asp
2275 2280 2285

Ala Val Ile Asp Thr Leu Ser Pro Glu Ser Phe Glu Thr Val Arg Gly
2290 2295 2300

Ala Lys Val Cys Gly Ala Glu Leu Leu His Gln Leu Thr Ala Asp Ile
2305 2310 2315 2320

Lys Gly Leu Asp Ala Phe Val Leu Phe Ser Ser Val Thr Gly Thr Trp
2325 2330 2335

Gly Asn Ala Gly Gln Gly Ala Tyr Ala Ala Ala Asn Ala Ala Leu Asp
2340 2345 2350

Ala Leu Ala Glu Arg Arg Arg Ala Ala Gly Leu Pro Ala Thr Ser Val
2355 2360 2365

Ala Trp Gly Leu Trp Gly Gly Gly Gly Met Ala Ala Gly Ala Gly Glu
2370 2375 2380

Glu Ser Leu Ser Arg Arg Gly Leu Arg Ala Met Asp Pro Asp Ala Ala
2385 2390 2395 2400

Val Asp Ala Leu Leu Gly Ala Met Gly Arg Asn Asp Val Cys Val Thr
2405 2410 2415

Val Val Asp Val Asp Trp Glu Arg Phe Ala Pro Ala Thr Asn Ala Ile
2420 2425 2430

Arg Pro Gly Arg Leu Phe Asp Thr Val Pro Glu Ala Arg Glu Ala Leu
2435 2440 2445

Thr Ala Ala Gly Thr Thr Ser Ala Thr Pro Asp Gly Ala Pro Glu Leu
2450 2455 2460

Ala Arg Arg Leu Ser Met Leu Asn Glu Thr Glu Arg Leu Arg Lys Leu
2465 2470 2475 2480

Val Glu Leu Val Arg Thr Glu Ala Ala Phe Val Leu Arg His Pro Asn
2485 2490 2495

Thr Asp Ala Ile Gly Ala Glu Arg Pro Phe Lys Ser Ala Gly Phe Asp
2500 2505 2510

Ser Leu Thr Ser Leu Glu Leu Arg Asn Arg Leu Asn Ala Gly Thr Gly
2515 2520 2525

Leu Lys Leu Pro Ala Thr Val Ile Phe Asp His Pro Ser Pro Thr Ala
2530 2535 2540

Leu Ala Arg Leu Leu Leu Asp Arg Leu Thr Gly Ala Gly Ala Pro Ala
2545 2550 2555 2560

Pro Ala Ala Asp Glu Pro Pro Leu Pro Val Ala Val Ala Asp Asp Asp
2565 2570 2575

Pro Val Val Ile Val Gly Met Ala Cys Arg Phe Pro Gly Gly Ala Gly
2580 2585 2590

Thr Pro Glu Ala Leu Trp Lys Leu Val Thr Glu Glu Arg Asp Val Ile
2595 2600 2605

Gly Ala Ala Pro Thr Asp Arg Gly Trp Asp Leu Asp Ser Val Tyr Asp
2610 2615 2620

Pro Glu Pro Gly Val Ala Gly Lys Thr Tyr Val Arg Glu Gly Gly Phe
2625 2630 2635 2640

Leu His Asp Ala Ala Glu Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro
2645 2650 2655

Arg Glu Ala Val Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr
2660 2665 2670

Ser Trp Glu Ala Ile Glu Arg Ala Gly Ile Asp Pro His Ser Leu His
2675 2680 2685

Gly Ser Arg Thr Gly Val Tyr Val Gly Leu Thr His Gln Glu Tyr Ala
2690 2695 2700

Ser Arg Leu His Glu Ala Pro Glu Glu Tyr Glu Gly Tyr Leu Leu Thr
2705 2710 2715 2720

Gly Lys Ser Ala Ser Val Val Ser Gly Arg Ile Ser Tyr Thr Leu Gly
2725 2730 2735

Leu Glu Gly Pro Ser Leu Ser Ile Asp Thr Ala Cys Ser Ser Ser Leu
2740 2745 2750

Val Ala Leu His Asn Ala Ala Gln Ala Leu Arg Gly Gly Glu Cys Asp
2755 2760 2765

Met Ala Leu Ala Gly Gly Val Thr Val Met Ala Ala Pro Gly Leu Phe
2770 2775 2780

Val Glu Phe Ser Arg Gln Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys
2785 2790 2795 2800

Ala Phe Ala Asp Gly Ala Asp Gly Thr Ala Trp Ala Glu Gly Ala Gly
2805 2810 2815

Val Val Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Leu Gly His Pro
2820 2825 2830

Val Leu Ala Val Val Cys Gly Ser Ala Val Asn Gln Asp Gly Ala Ser
2835 2840 2845

Asn Gly Leu Thr Ala Pro Ser Gly Pro Ser Gln Glu Arg Val Ile Arg
2850 2855 2860

Gln Ala Leu Ala Asn Ala Arg Leu Thr Val Ala Asp Val Asp Val Val
2865 2870 2875 2880

Glu Ala His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln
2885 2890 2895

Ala Leu Leu Gly Thr Tyr Gly Arg Asp Arg Asp Ala Glu Cys Pro Val
2900 2905 2910

Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Ala Gln Ala Ala Ala
2915 2920 2925

Gly Val Ala Gly Val Ile Lys Met Val Leu Ala Met Arg Tyr Gly Trp
2930 2935 2940

Leu Pro Arg Thr Leu His Val Asp Glu Pro Ser Arg His Val Asp Trp
2945 2950 2955 2960

Ser Ala Gly Gly Val Arg Leu Leu Thr Glu Ala Arg Glu Trp Pro Gly
2965 2970 2975

Val Asp Arg Pro Arg Arg Ala Ala Val Ser Ala Phe Gly Val Ser Gly
2980 2985 2990

Thr Asn Ala His Leu Ile Leu Glu Ala Pro Glu Ala Leu Glu Ala Leu
2995 3000 3005

Glu Ala Thr Asp Ala Pro Glu Ala Pro Glu Ala Pro Glu Ala Pro Asp
3010 3015 3020

Val Thr Asp Val Thr Glu Ala Leu Glu Ala Pro Asp Ala Thr Glu Ala
3025 3030 3035 3040

Glu Gly Ala Lys Ala Pro Gly Ser Pro Glu Glu Ala Gln Pro Ala Val
3045 3050 3055

Gly Val Val Pro Val Val Val Ser Gly Arg Ser Arg Val Val Val Arg
3060 3065 3070

Glu Ala Ala Gly Arg Leu Ala Glu Val Val Glu Ala Gly Gly Val Gly
3075 3080 3085

Leu Ala Asp Val Ala Val Thr Met Ala Gly Arg Ser Arg Phe Gly Tyr
3090 3095 3100

Arg Ala Val Val Leu Ala Arg Gly Glu Ala Glu Leu Ala Gly Arg Leu
3105 3110 3115 3120

Arg Ala Leu Ala Gly Gly Asp Pro Asp Ala Gly Val Val Thr Gly Ala
3125 3130 3135

Val Val Asp Pro Glu Thr Gly Ser Gly Gly Gly Gly Val Val Leu Val
3140 3145 3150

Phe Pro Gly Gln Gly Thr Gln Trp Val Gly Met Gly Ala Gly Leu Leu
3155 3160 3165

Gly Ser Ser Glu Val Phe Ala Ala Ser Met Arg Glu Cys Ala Arg Ala
3170 3175 3180

Leu Ser Val His Val Glu Trp Asp Leu Leu Glu Val Val Ser Gly Gly
3185 3190 3195 3200

Ala Gly Leu Glu Arg Val Asp Val Val Gln Pro Val Thr Trp Ala Val
3205 3210 3215

Met Val Ser Leu Ala Arg Tyr Trp Gln Ala Met Gly Val Asp Val Ala
3220 3225 3230

Ala Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Ala Thr Val Ala
3235 3240 3245

Gly Ala Leu Ser Leu Glu Asp Ala Ala Ala Val Val Ala Leu Arg Ala
3250 3255 3260

Gly Leu Ile Gly Arg Tyr Leu Ala Gly Arg Gly Ala Met Ala Ala Val
3265 3270 3275 3280

Pro Leu Pro Ala Gly Glu Val Glu Ala Gly Leu Ala Lys Trp Pro Gly
3285 3290 3295

Val Gln Val Ala Ala Val Asn Gly Pro Ala Ser Thr Val Val Ser Gly
3300 3305 3310

Asp Arg Arg Ala Val Ala Gly Tyr Val Ala Val Cys Gln Ala Glu Gly
3315 3320 3325

Val Gln Ala Arg Leu Ile Pro Val Asp Tyr Ala Ser His Ser Arg His
3330 3335 3340

Val Glu Asp Leu Lys Gly Glu Leu Glu Arg Val Leu Ser Gly Ile Arg
3345 3350 3355 3360

Pro Arg Ser Pro Arg Val Pro Val Cys Ser Thr Val Ala Gly Glu Gln
3365 3370 3375

Pro Gly Glu Pro Val Phe Asp Ala Gly Tyr Trp Phe Arg Asn Leu Arg
3380 3385 3390

Asn Arg Val Glu Phe Ser Ala Val Val Gly Gly Leu Leu Glu Gln Gly
3395 3400 3405

His Arg Arg Phe Ile Glu Val Ser Ala His Pro Val Leu Val His Ala
3410 3415 3420

Ile Glu Gln Thr Ala Glu Ala Ala Asp Arg Ser Val His Ala Thr Gly
3425 3430 3435 3440

Thr Leu Arg Arg Gln Asp Asp Ser Pro His Arg Leu Leu Thr Ser Thr
3445 3450 3455

Ala Glu Ala Trp Ala His Gly Ala Thr Leu Thr Trp Asp Pro Ala Leu
3460 3465 3470

Pro Pro Gly His Leu Thr Thr Leu Pro Thr Tyr Pro Phe Asn His His
3475 3480 3485

His Tyr Trp Ala Val Thr Ser Pro Ala Gly Val Gly Asp Ala Ala Ala
3490 3495 3500

Gly Arg Phe Gly Met Thr Trp Glu Asp His Pro Phe Leu Arg Gly Gly
3505 3510 3515 3520

Leu Pro Leu Ala Asp Ser Gly Glu Arg Val Phe Ala Gly Arg Leu Ala
3525 3530 3535

Gly Ser Glu His Asp Trp Leu Thr Asp His Ala Val Ser Gly Val Thr
3540 3545 3550

Leu Leu Pro Gly Thr Ala Phe Val Glu Phe Ala Leu His Ala Gly Ala
3555 3560 3565

Ala Thr Gly Cys Gly Arg Leu Glu Glu Leu Ser Val Glu Ala Pro Leu
3570 3575 3580

Val Leu Pro Ala Ala Gly Gly Val Arg Val Gln Met Arg Val Ser Ala
3585 3590 3595 3600

Ala Asp Glu Ser Gly Arg Arg Arg Val Ala Ile His Ser Ala Pro Glu
3605 3610 3615

Ala Ala Val His Ser Ala Ala Glu Gly Gly Asp Ser Ala Gly Val Trp
3620 3625 3630

Thr Arg His Gly Glu Gly Thr Leu Val Pro Asp Pro Glu Pro Thr Pro
3635 3640 3645

Pro Asp Ala Asp Trp Ala Arg Ala Trp Pro Pro Ala Gly Glu Arg Val
3650 3655 3660

Glu Pro Ala Glu Leu Tyr Glu Arg Phe Gly Ala Leu Gly Tyr Glu Tyr
3665 3670 3675 3680

Gly Glu Ala Phe Ala Gly Val Arg Ala Val Trp Arg Gln Pro Asp Ala
3685 3690 3695

Leu Leu Ala Glu Val Leu Leu Pro Asp Arg Ala Ser Thr Gly Ala Gly
3700 3705 3710

Arg Phe Gly Val His Pro Ala Leu Leu Asp Ala Ala Leu Gln Pro Trp
3715 3720 3725

Ile Ala Gly Gly Leu Leu Glu Val Pro Glu Asp Ala Val Leu Leu Pro
3730 3735 3740

Phe Ala Trp Gln Gly Val Ser Leu Tyr Ala Thr Gly Ala Gly Ala Leu
3745 3750 3755 3760

Arg Val Arg Leu Thr Lys Ala Gly Asp Gly Ala Val Ser Leu Gln Ala
3765 3770 3775

Ala Asp Thr Ser Gly Ala Ala Val Leu Ser Leu Gly Ala Leu Val Met
3780 3785 3790

Arg Pro Leu Ala Arg Arg Lys Leu Asp Val Leu Leu Gly Thr Asp Ala
3795 3800 3805

Gly Glu Arg Ser Leu Tyr Arg Val Glu Trp Gln Pro Arg Leu Leu Pro
3810 3815 3820

Ala Gly Pro Pro Arg Ser Trp Ala Val Leu Gly Pro Asp Ala Asp Arg
3825 3830 3835 3840

Leu Ala Gly Thr Pro Gly Leu Gly Asp Gln Pro Asp Gly Gly Pro Thr
3845 3850 3855

Ala Leu Tyr Pro Glu Val Arg Ala Leu Arg Lys Ala Leu Ala Ala Gly
3860 3865 3870

Ala Pro Arg Pro Glu Ala Val Val Leu Pro Val Leu Ser Gly Ala Gly
3875 3880 3885

Ala Thr Pro Glu Ser Val Arg Gln Thr Thr Glu Arg Cys Leu Thr Ala
3890 3895 3900

Leu Gln Asp Trp Leu Asp Ala Glu Glu Leu Val Asp Thr Pro Leu Ile
3905 3910 3915 3920

Val Leu Thr Arg Gly Ala Val Ala Ala Val Pro Gly Glu Glu Ile Gly
3925 3930 3935

Asp Leu Ala Cys Ala Gly Val Trp Gly Leu Val Arg Ser Ala Arg Ser
3940 3945 3950

Glu His Pro Gly Arg Phe Ala Leu Val Asp Thr Asp Gly His Pro Asp
3955 3960 3965

Asp Arg Thr Ala Leu Pro Leu Ala Leu Arg Ala Val Leu Asp Gly Ala
3970 3975 3980

Gly Gln Leu Ser Leu Arg Ala Gly Thr Ala Arg Thr Pro Val Leu Leu
3985 3990 3995 4000

Arg Ala Gly Thr Pro Glu Glu Gln Arg Gly Pro Ala Phe Asp Pro Ala
4005 4010 4015

Gly Thr Val Leu Val Thr Gly Ala Thr Gly Thr Leu Gly Arg Leu Leu
4020 4025 4030

Ala Arg His Leu Ala Ala Glu His Gly Val Arg His Leu Leu Leu Leu
4035 4040 4045

Ser Arg Gly Gly Arg Ala Ala Glu Gly Ala Asp Glu Leu Ala Ala Glu
4050 4055 4060

Leu Ala Gly Leu Glu Ala Glu Pro Cys Phe Ala Ala Cys Asp Ala Ala
4065 4070 4075 4080

Asp Arg Glu Ala Leu Ala Arg Val Leu Ala Glu Val Pro Ala Asp Arg
4085 4090 4095

Pro Leu Thr Gly Val Ile His Ala Ala Gly Val Leu Asp Asp Gly Thr
4100 4105 4110

Leu Asp Ala Leu Thr Pro Glu Arg Ile Gly Thr Val Met Arg Pro Lys
4115 4120 4125

Ala Asp Ala Ala Leu Asn Leu His Glu Leu Thr Arg Thr Ser Pro Leu
4130 4135 4140

Ser Val Phe Ala Val Phe Ser Gly Ala Ala Gly Ile Leu Gly Arg Pro
4145 4150 4155 4160

Gly Gln Ala Asn Tyr Ala Ala Ala Asn Thr Phe Leu Asp Ala Leu Ala
4165 4170 4175

Gln His Arg Arg Ala His Gly Leu Pro Ala Val Ser Leu Ala Trp Gly
4180 4185 4190

Leu Trp Gly Gly Ala Thr Gly Met Thr Gly His Leu Ser Gly Thr Asp
4195 4200 4205

Leu Arg Arg Met Arg Arg Ser Gly Ile Ala Pro Met Thr His Asp Gln
4210 4215 4220

Gly Leu Ala Leu Phe Asp Arg Ala Leu Ala Ala Ser Ala Glu Asp Pro
4225 4230 4235 4240

Leu Leu Val Pro Met Arg Leu Asp Leu Ala Ala Leu Val Arg Glu Arg
4245 4250 4255

Ala Glu His Gly Pro Asp Ala Val Pro Gly Pro Leu Leu Gly Leu Leu
4260 4265 4270

Pro Ala Arg Ala Ala Val Arg Gln Ala Ala Ala Pro Val Arg Gly Gly
4275 4280 4285

Ala Pro Ala Pro Ala Gly Gly Glu Gly Thr Ala Glu Arg Leu Ala Gly
4290 4295 4300

Leu Gly Glu Glu Ala Arg Leu Arg Glu Leu Val Arg Leu Val Arg Ala
4305 4310 4315 4320

Glu Val Ser Gly Val Leu Gly Tyr Ser Gly Pro Asp Ala Val Glu Pro
4325 4330 4335

```
Gly Arg Pro Phe Lys Asp Leu Gly Phe Asp Ser Leu Thr Ala Val Glu
            4340                4345                4350

Leu Arg Asn Arg Leu Gly Ala Ala Thr Gly Leu Arg Leu Pro Thr Ala
        4355                4360                4365

Leu Val Phe Asp Arg Pro Thr Ser Gln Ala Val Ala Glu Tyr Leu Ala
    4370                4375                4380

Ala Glu Leu Ala Gly Pro Arg Asp Gly Gly Asp Thr Ala Ala Ala Ala
4385                4390                4395                4400

Phe Glu Gly Leu Glu Ala Leu Ala Ala Ala Val Gly Ala Leu Ala Glu
                4405                4410                4415

Asp Asp Leu Arg Arg Asp Val Leu Arg Arg Arg Leu Thr Glu Leu Ala
            4420                4425                4430

Ala Ala Leu Thr Pro Gln Gly Arg Asn Pro Ser Ala Pro Ala Pro Ala
        4435                4440                4445

Pro Ser Asp Leu Asp Glu Arg Leu Asp Ser Ala Asn Asp Asp Asp Leu
    4450                4455                4460

Phe Ala Phe Ile Glu Glu Gln Leu *
4465                4470
```

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1865 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

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Met Thr Ala Glu Leu Val Ala Thr Arg Lys Arg Leu Gly Ala Leu Glu
1               5                   10                  15

Glu Arg Ala Arg Glu Pro Ile Ala Val Val Ala Met Ser Cys Arg Tyr
            20                  25                  30

Pro Gly Gly Val Thr Thr Pro Glu Asp Leu Trp Arg Leu Leu Ala Asp
        35                  40                  45

Glu Arg Asp Ala Val Ser Gly Leu Pro Arg Asp Arg Gly Trp Asp Leu
    50                  55                  60

Asp Ala Leu Tyr Asp Pro Asp Gly Gly Pro Gly Thr Ser Tyr Ala Arg
65                  70                  75                  80

Glu Gly Gly Phe Leu Ser His Cys Ala Gly Phe Asp Ala Glu Phe Phe
                85                  90                  95

Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu
            100                 105                 110
```

```
Leu Leu Glu Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly Val Thr Ala
        115                 120                 125

Asp Arg Ala Arg Gly Ser Arg Thr Gly Val Tyr Ala Gly Val Met Tyr
    130                 135                 140

Asp Asp Tyr Gly Ala Arg Val Leu Tyr Gly Ala Gly Ala Gly Pro Pro
145                 150                 155                 160

Glu Asp Leu Glu Gly Tyr Leu Val Asn Gly Ser Ala Gly Ser Ile Ala
                165                 170                 175

Ser Gly Arg Val Ser Tyr Thr Phe Gly Leu Arg Gly Pro Ala Val Thr
            180                 185                 190

Val Asn Thr Ala Cys Ser Ser Ser Leu Val Ser Leu His Leu Ala Val
        195                 200                 205

Arg Ala Leu Arg Asn Gly Glu Cys Asp Met Ala Leu Ala Gly Gly Ala
    210                 215                 220

Thr Val Leu Ser Thr Pro Thr Val Leu Val Asp Phe Ser Arg Gln Arg
225                 230                 235                 240

Gly Leu Ala Pro Asp Gly Arg Cys Lys Ala Phe Ala Asp Ser Ala Asp
                245                 250                 255

Gly Thr Ser Trp Ala Glu Gly Ala Gly Met Leu Leu Leu Gln Arg Leu
            260                 265                 270

Ser Asp Ala Arg Arg Glu Gly Arg Pro Val Leu Ala Val Ile Arg Gly
        275                 280                 285

Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn
    290                 295                 300

Gly Arg Ala Gln Arg Gln Val Ile Glu Asp Ala Leu Arg Asp Ala Gly
305                 310                 315                 320

Val Gly Pro Asp Gln Val Asp Ala Val Glu Ala His Gly Thr Gly Thr
                325                 330                 335

Glu Leu Gly Asp Pro Ile Glu Ala Gly Ala Leu Leu Ala Thr Tyr Gly
            340                 345                 350

Thr Ala Arg Thr Ala Glu Arg Pro Leu Trp Leu Gly Ser Leu Lys Ser
        355                 360                 365

Asn Ile Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys
    370                 375                 380

Met Val Leu Ala Met Arg His Gly Arg Leu Pro Arg Thr Leu His Val
385                 390                 395                 400

Asp Arg Pro Thr Thr Arg Val Asp Trp Glu Lys Gly Gly Val Arg Leu
                405                 410                 415

Leu Thr Glu Pro Val Pro Trp Pro Gly Glu Ala Gly Glu Pro Arg Arg
            420                 425                 430
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```
Ala Gly Val Ser Ser Phe Gly Ala Ser Gly Thr Asn Ala His Val Val
        435                 440                 445

Leu Glu Ser Val Pro Ala Gly Glu Pro Pro Ala Ala Gly Arg Pro Glu
    450                 455                 460

Asp Thr Gly Gly Ala Trp Thr Val Ser Gly Arg Gly Pro Ala Ala Leu
465                 470                 475                 480

Arg Ala Gln Ala Ala Arg Leu Tyr Asp Ala Leu Thr Gly Thr Gly Thr
                485                 490                 495

Gly Thr Gly Gln Gly Ala Gly Gln Gly Ala Gly Pro Gly Thr Ala Glu
            500                 505                 510

Val Ala Gly Ala Leu Ala His Ala Arg Thr Ala Phe Arg His Arg Ala
        515                 520                 525

Val Val Leu Gly Gly Asn Arg Ala Glu Leu Leu Ala Gly Leu Arg Glu
    530                 535                 540

Leu Ala Glu Glu Glu His Pro Gly Pro Arg Val Val Thr Gly Thr Ala
545                 550                 555                 560

Pro Ala Thr Glu Arg Arg Thr Ala Phe Leu Phe Ser Gly Gln Gly Ser
                565                 570                 575

Gln Arg Ala Gly Ser Gly Arg Gly Leu Tyr Arg Arg His Pro Val Phe
            580                 585                 590

Ala Arg Ala Leu Asp Glu Val Cys Ala Ala Leu Glu Pro His Leu His
        595                 600                 605

Arg Pro Leu Arg Asp Leu Met Phe Ala Glu Pro Gly Ser Pro Glu Ala
    610                 615                 620

Glu Pro Leu Asp Arg Thr Glu Phe Thr Gln Pro Ala Leu Phe Ala Leu
625                 630                 635                 640

Gln Thr Ala Leu Phe Arg Leu Ala Glu His His Gly Leu Arg Ala Glu
                645                 650                 655

Ala Leu Cys Gly His Ser Val Gly Glu Ile Ala Ala Ala His Ala Ala
            660                 665                 670

Gly Val Leu Thr Leu Pro Asp Ala Ala Arg Leu Val Ala Ala Arg Gly
        675                 680                 685

Arg Leu Met Gln Ala Leu Pro Ala Gly Gly Ala Met Ala Ala Leu Arg
    690                 695                 700

Ala Thr Ala Glu Glu Ile Ala Pro Leu Leu Glu Arg Arg Ala Gly Glu
705                 710                 715                 720

Leu Ala Leu Ala Ala Val Asn Gly Pro Ser Ser Val Val Val Ser Gly
                725                 730                 735

Asp Glu Ala Ala Val Leu Glu Leu Leu Glu Gln Trp Arg Ala Glu Gly
            740                 745                 750
```

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Arg Glu Ala Arg Arg Leu Ala Val Ser His Ala Phe His Ser Pro Arg
        755                 760                 765

Met Asp Gly Met Leu Thr Gln Phe Asp Arg Val Ala Arg Thr Leu Thr
    770                 775                 780

Phe Ala Pro Pro Thr Ile Pro Leu Val Ser Thr Leu Thr Gly Thr Pro
785                 790                 795                 800

Val Thr Glu Glu Thr Leu Cys Thr Ala Asp His Trp Val Arg Gln Ala
                805                 810                 815

Arg Glu Pro Val Arg Phe Leu Asp Ala Met Arg Thr Leu Arg Ala Asp
            820                 825                 830

Gly Ile Asp Thr Phe Val Glu Leu Gly Pro Asp Gly Val Leu Ser Ala
        835                 840                 845

Met Ala Arg Asp Cys Ala Asp Asp Arg Pro Asp Gly Asp Thr Thr Gly
    850                 855                 860

Ala Gly Asp Gly Glu Thr Pro Asp Pro Leu Leu Thr Leu Pro Leu Leu
865                 870                 875                 880

Arg Arg Ser Val Pro Glu Thr Gly Asp Ala Glu His Pro Gly Gly Phe
                885                 890                 895

Glu Arg Ala Leu Ala Thr Ala Tyr Ala His Gly Val Pro Leu Arg Leu
            900                 905                 910

Ala Pro Ala Pro Asp Ala Ala Ser Leu Ala Val Ala Ala Glu Leu Pro
        915                 920                 925

Thr Tyr Ala Phe Gln Arg Thr His Tyr Trp Leu Asp Ala Pro Ala Ala
    930                 935                 940

Pro Ala Ala Leu Pro Ala Gly Leu Asp Asp Ala Gly His Pro Leu Leu
945                 950                 955                 960

Ser Ala Ala Leu Asp Leu Pro Gly Gly Arg Gly Thr Val Trp Thr Gly
                965                 970                 975

Ala Leu Ser Ala Ala Thr Leu Pro Trp Ala Ala Asp His Ser Val His
            980                 985                 990

Gly Arg Thr Val Leu Pro Gly Thr Ala Leu Leu Asp Leu Ala Leu His
        995                 1000                1005

Ala Ala Pro Arg Val Gly Glu Leu Thr Phe Glu Ala Pro Leu Val Leu
    1010                1015                1020

Pro Glu Asp Gly Glu Val Arg Leu Arg Val Val Leu Ala Glu Pro Asp
1025                1030                1035                1040

Ala Ser Gly Val Arg Glu Leu Ser Val His Ser Ala Gly Glu Asp Gly
                1045                1050                1055

Gly Trp Thr Arg His Ala Thr Ala Val Leu Asp Thr Gly Thr Thr Thr
            1060                1065                1070
```

Ala Gly Glu Pro Ala Gly Ala Pro Pro Ala Ala Trp Pro Pro Gly Asp
1075 1080 1085

Ala Glu Pro Leu Asp Leu Ala Ala Glu Tyr Glu Arg Phe Ala Asp Ala
1090 1095 1100

Gly Ile Gly Tyr Gly Pro Ala Phe Arg Gly Leu Arg Ser Ala Trp Arg
1105 1110 1115 1120

Asp Gly Asp Ala Ile Leu Ala Asp Val Arg Leu Pro Gly Glu Leu Ala
1125 1130 1135

Gly Glu Ala Asp Arg Tyr Gly Ile His Pro Ala Leu Leu Asp Ala Ala
1140 1145 1150

Leu His Thr Ala Ala Ala Ala Leu Gly Gly Ala His Gly Met Leu Pro
1155 1160 1165

Phe Thr Trp Asn Gly Val Thr Leu His Ala Arg Gly Ala His Ala Ile
1170 1175 1180

Arg Val Arg Leu Thr Pro Ala Gly Pro Asp Ala Val Ala Val Thr Ala
1185 1190 1195 1200

Val Asp Pro Ala Gly Arg Pro Val Phe Thr Ala Ala Ser Leu Thr Leu
1205 1210 1215

Arg Pro Val Thr Thr Gly Gln Leu Thr Ala Ala Glu Ala Ala Arg Ala
1220 1225 1230

Pro Leu Tyr Arg Val Arg Trp Thr Gly Leu Pro Asp Thr Gly Thr Ala
1235 1240 1245

Arg Asp His Thr Trp Ala Val Ala Gly Gly Pro Gly Asp Leu Leu Pro
1250 1255 1260

Gly Glu Thr Pro His His Pro Asp Leu Ala Ser Ala Leu Ala Asp Thr
1265 1270 1275 1280

Gly Thr Ala Pro Phe Arg Val Leu Ala Asp Leu Arg Gly Tyr Gly Thr
1285 1290 1295

Ala Thr Pro Arg Glu Leu Ala Ser Gln Ala Leu Ala Leu Val Gln Gln
1300 1305 1310

Trp Ala Asp Ala Ala Glu Ala Ala Glu Gly Arg Leu Val Leu Val Thr
1315 1320 1325

Arg Arg Ala Val Asp Ile Gly Asp Gly Val Thr Asp Pro Ala Ala Ala
1330 1335 1340

Thr Val Trp Gly Leu Val Arg Ala Ala Gln Ser Glu His Pro Gly Cys
1345 1350 1355 1360

Phe Ala Leu Leu Asp Thr Asp Asp Ser Pro Arg Ser Arg Gln Leu Leu
1365 1370 1375

Pro Arg Val Ala Gly Thr Ala Glu Gln Leu Ala Leu Arg Asp Gly Thr
1380 1385 1390

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Leu Leu Ala Pro Ser Leu Thr Arg Ala Thr Leu Pro Ala Gly Ala Arg
        1395                1400                1405

Leu Pro Ala Leu Asp Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Ser
    1410                1415                1420

Leu Gly Ala Glu Ala Ala Arg His Leu Val Thr Arg His Gly Ala Arg
1425                1430                1435                1440

Arg Leu Leu Leu Thr Ser Arg Ser Gly Pro Gln Ala Pro Gly Ala Ala
                1445                1450                1455

Glu Leu Val Ala Glu Leu Ala Ala Leu Gly Ala His Ala Asp Val Ala
            1460                1465                1470

Ala Cys Asp Val Ala Asp Arg Ala Ala Leu Arg Ala Leu Leu Asp Arg
        1475                1480                1485

Val Pro Ala Gly His Pro Leu Thr Ala Val Leu His Thr Ala Gly Val
    1490                1495                1500

Leu Asp Asp Gly Val Leu Thr Ala Gln Thr Pro Gln Arg Leu Ala Ala
1505                1510                1515                1520

Val Leu Arg Pro Lys Ala Asp Ala Val Arg Asn Leu His Glu Leu Thr
                1525                1530                1535

Gln Gly His Ala Leu Ser Ala Phe Ile Leu Tyr Ser Ser Ala Ala Gly
            1540                1545                1550

Val Leu Gly Ser Ala Gly Gln Ser Gly Tyr Ala Ala Ala Asn Ala Tyr
        1555                1560                1565

Leu Asp Ser Phe Ala Val Trp Arg Arg Ser Arg Gly Leu Pro Ala Val
    1570                1575                1580

Ser Leu Gly Trp Gly Pro Trp Asp Gly Gly Gly Met Ala Ser Gly Leu
1585                1590                1595                1600

Gly Gly Thr Asp Thr Ala Arg Leu Arg Arg Ser Gly Ile Ala Pro Leu
                1605                1610                1615

Ser Arg Ala Glu Gly Leu Ala Ala Leu Asp Ala Ala Leu Ala Ala Gly
            1620                1625                1630

Gly Asp Asp Thr Ala Pro Ala His Leu Leu Pro Ile Arg Val Asp Ala
        1635                1640                1645

Val Thr Leu Arg Gly Ala Asp Thr Val Pro Ala Val Leu Arg Asp Leu
    1650                1655                1660

Ala Gly Thr Ala Pro Ser Ala Ala Glu Arg Pro Pro Gly Thr Pro Glu
1665                1670                1675                1680

Asp Thr Asn Ala Pro Leu Ala Asp Val Thr Gln Leu His Gly Arg Glu
                1685                1690                1695

Arg Lys Glu Ala Leu Thr Gly Phe Val Arg Ala Gln Val Ala Ala Val
            1700                1705                1710
```

```
Leu Gly His Pro Thr Ser Asp Thr Ile Asp Val Arg Arg Ser Phe Lys
        1715                1720                1725

Glu Ala Gly Phe Asp Ser Leu Thr Ala Val Glu Leu Arg Asn Arg Leu
    1730                1735                1740

Arg Ala Ala Thr Gly Leu Lys Leu Pro Ala Thr Leu Val Phe Asp His
1745                1750                1755                1760

Pro Thr Pro Leu Ala Leu Ala Gly Phe Leu His Arg Glu Leu Pro Gly
                1765                1770                1775

Ala Glu Ala Ser Leu Met Ser Ala Ile Asp Thr Leu Arg His Arg Leu
            1780                1785                1790

Arg Asp Ala Leu Ala Asp Asp Ala Ala Asp Asp Ala Leu Arg Asp Gln
        1795                1800                1805

Ile Thr Arg Arg Leu Glu Thr Leu Leu Ala Gly Ile Ala Arg Thr Glu
    1810                1815                1820

Glu Pro Ala Pro Ala Thr Ala Ala Ala Asp Asp Gly Ser Gly Ala Gly
1825                1830                1835                1840

Asp Val Ala Glu Arg Leu Ser Thr Ala Ser Asp Asp Glu Leu Phe Glu
                1845                1850                1855

Leu Leu Asp Ser Gly Phe Thr Pro  *
            1860                1865
```

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 3730 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

```
Met Ser Thr Glu Asn Ser Thr Asn Val Pro Ala Ser Glu Asp Lys Leu
1               5                   10                  15

Arg Ala Tyr Leu Arg Arg Ala Met Ala Asp Leu His Glu Ser Arg Glu
            20                  25                  30

Arg Leu Arg Ala Thr Glu Ala Arg Ala Gln Glu Pro Ile Ala Val Val
        35                  40                  45

Gly Met Gly Cys Arg Phe Pro Gly Gly Val Gly Ser Pro Glu Ala Leu
    50                  55                  60

Trp Arg Leu Val Val Glu Gly Val Asp Ala Val Ser Pro Phe Pro Gly
65                  70                  75                  80

Asp Arg Gly Trp Asp Val Glu Gly Leu Tyr Asp Pro Glu Pro Gly Val
                85                  90                  95
```

```
Ala Gly Lys Ser Tyr Val Arg Glu Gly Gly Phe Leu His Asp Ala Ala
            100                 105                 110

Glu Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg Glu Ala Val Ala
        115                 120                 125

Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Ile
    130                 135                 140

Glu Arg Ala Gly Ile Asp Pro His Ser Leu His Gly Ser Arg Thr Gly
145                 150                 155                 160

Val Tyr Ala Gly Val Met Tyr His Asp Tyr Gly Thr Gly Gln Thr Ser
                165                 170                 175

Ala Thr Asp Thr Ser Gly Tyr Ser Gly Thr Gly Thr Ser Gly Ser Val
            180                 185                 190

Val Ser Gly Arg Val Ala Tyr Thr Leu Gly Leu Glu Gly Pro Ala Val
        195                 200                 205

Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu His Leu Ala
    210                 215                 220

Val Gln Ala Leu Arg Gly Gly Glu Cys Asp Met Ala Leu Ala Gly Gly
225                 230                 235                 240

Val Thr Val Met Ala Gly Pro Gly Met Phe Val Glu Phe Ser Arg Gln
                245                 250                 255

Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys Ala Phe Ala Asp Gly Ala
            260                 265                 270

Asp Gly Thr Ala Trp Ala Glu Gly Ala Gly Val Val Leu Val Glu Arg
        275                 280                 285

Leu Ser Asp Ala Arg Arg Leu Gly His Pro Val Leu Ala Val Val Cys
    290                 295                 300

Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro
305                 310                 315                 320

Ser Gly Pro Ser Gln Glu Arg Val Ile Arg Gln Ala Leu Ala Asn Ala
                325                 330                 335

Arg Leu Thr Val Ala Asp Val Asp Val Val Glu Ala His Gly Thr Gly
            340                 345                 350

Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu Gly Thr Tyr
        355                 360                 365

Gly Arg Asp Arg Asp Gly Gly Arg Pro Val Trp Leu Gly Ser Leu Lys
    370                 375                 380

Ser Asn Ile Gly His Ala Gln Ala Ala Ala Gly Val Ala Gly Val Ile
385                 390                 395                 400

Lys Met Val Leu Ala Met Arg Tyr Gly Trp Leu Pro Arg Thr Leu His
                405                 410                 415
```

Val Asp Glu Pro Ser Arg His Val Asp Trp Ser Ala Gly Gly Val Trp
420 425 430

Leu Leu Thr Glu Ala Arg Glu Trp Pro Gly Val Asp Arg Pro Arg Arg
435 440 445

Ala Ala Val Ser Ala Phe Gly Val Ser Gly Thr Asn Ala His Leu Ile
450 455 460

Leu Glu Ala Pro Asp Thr Ala Glu Ala Glu Ser Ala Thr Thr Pro Val
465 470 475 480

Arg Ser Glu Val Ser Glu Ser Ala Ala Val Phe Asp Ala Arg Ser Gly
485 490 495

Val Val Pro Val Val Val Ser Gly Arg Ser Arg Val Val Val Arg Glu
500 505 510

Ala Ala Gly Arg Leu Ala Glu Val Val Glu Ala Gly Gly Val Gly Leu
515 520 525

Ala Asp Val Ala Val Thr Met Ala Gly Arg Ser Arg Phe Gly Tyr Arg
530 535 540

Ala Val Val Leu Ala Arg Gly Glu Ala Glu Leu Ala Gly Arg Leu Arg
545 550 555 560

Ala Leu Ala Gly Gly Asp Pro Asp Ala Gly Val Val Thr Gly Ala Val
565 570 575

Val Asp Pro Glu Thr Gly Ser Gly Gly Gly Gly Val Val Leu Val Phe
580 585 590

Pro Gly Gln Gly Thr Gln Trp Val Gly Met Gly Ala Gly Leu Leu Gly
595 600 605

Ser Ser Glu Val Phe Ala Ala Ser Met Arg Glu Cys Ala Arg Ala Leu
610 615 620

Ser Val His Val Gly Trp Asp Leu Leu Glu Val Val Ser Gly Gly Ala
625 630 635 640

Gly Leu Glu Arg Val Asp Val Val Gln Pro Val Thr Trp Ala Val Met
645 650 655

Val Ser Leu Ala Arg Tyr Trp Gln Ala Met Gly Val Asp Val Ala Ala
660 665 670

Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Ala Thr Val Ala Gly
675 680 685

Ala Leu Ser Leu Glu Asp Ala Ala Ala Val Val Ala Leu Arg Ala Gly
690 695 700

Leu Ile Gly Arg Tyr Leu Ala Gly Arg Gly Ala Met Ala Ala Val Pro
705 710 715 720

Leu Pro Ala Gly Glu Val Glu Ala Gly Leu Ala Lys Trp Pro Gly Val
725 730 735

```
Glu Val Ala Ala Val Asn Gly Pro Ala Ser Thr Val Val Ser Gly Asp
            740                 745                 750

Arg Arg Ala Val Ala Gly Tyr Val Ala Val Cys Gln Ala Glu Gly Val
        755                 760                 765

Gln Ala Arg Leu Ile Pro Val Asp Tyr Ala Ser His Ser Arg His Val
    770                 775                 780

Glu Asp Leu Lys Gly Glu Leu Glu Arg Val Leu Ser Gly Ile Arg Pro
785                 790                 795                 800

Arg Ser Pro Arg Val Pro Val Cys Ser Thr Val Ala Gly Glu Gln Pro
                805                 810                 815

Gly Glu Pro Val Phe Asp Ala Gly Tyr Trp Phe Arg Asn Leu Arg Asn
            820                 825                 830

Arg Val Glu Phe Ser Ala Val Val Gly Gly Leu Leu Glu Glu Gly His
        835                 840                 845

Arg Arg Phe Ile Glu Val Ser Ala His Pro Val Leu Val His Ala Ile
    850                 855                 860

Glu Gln Thr Ala Glu Ala Ala Asp Arg Ser Val His Ala Thr Gly Thr
865                 870                 875                 880

Leu Arg Arg Gln Asp Asp Ser Pro His Arg Leu Leu Thr Ser Thr Ala
                885                 890                 895

Glu Ala Trp Ala His Gly Ala Thr Leu Thr Trp Asp Pro Ala Leu Pro
            900                 905                 910

Pro Gly His Leu Thr Thr Leu Pro Thr Tyr Pro Phe Asn His His His
        915                 920                 925

Tyr Trp Leu Asp Thr Thr Pro Thr Thr Pro Ala Thr Thr Thr Gln Ser
    930                 935                 940

Pro Thr Asp Ala Gln Asn Pro Ala Asp Ala Leu Pro Tyr Lys Val Ser
945                 950                 955                 960

Trp Lys Arg Leu Arg Asp Gln Asp Ser Leu Thr Ala Arg Leu Asp Gly
                965                 970                 975

Arg Trp Leu Leu Val Val Pro Glu Ala Ser Ala Asp Pro Ser Val Ala
            980                 985                 990

Glu Gly Val Ala Arg Glu Leu Thr Ala Arg Gly Ala Thr Val Glu Ser
        995                 1000                1005

Leu Thr Val Glu Pro Gly Ala Asp Arg Ser Arg Leu Arg Gly Leu Leu
    1010                1015                1020

Val Asp Ala Thr Glu Arg Asp Glu Ala Gly Pro Leu Arg Gly Ile Val
1025                1030                1035                1040

Ser Leu Leu Ala Leu Ala Gly Asp His Ala Gly Ala Asp Gly Ala Arg
                1045                1050                1055
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Pro Val Val Pro Ala Gly Leu Ala Ala Ser Leu Ala Leu Ile Gln Ala
            1060                1065                1070

Ala Gly Asp Ala Gly Thr Glu Ala Gly Leu Trp Ala Val Thr Arg Gly
        1075                1080                1085

Ala Val Ala Ala Val Pro Gly Asp Val Pro Ala Pro Ser Gln Ala Leu
    1090                1095                1100

Leu Trp Gly Phe Gly Arg Val Ala Gly Ile Glu Leu Pro His Cys Trp
1105                1110                1115                1120

Gly Gly Leu Leu Asp Leu Pro Thr Gly Pro Gly Asp Ser Gly Phe Arg
                1125                1130                1135

Gln Leu Ala Ala Thr Leu Ala Gly Arg Pro Ala Glu Asp Gln Val Ala
            1140                1145                1150

Leu Arg Ala Ser Gly Ala Tyr Gly Arg Arg Leu Val Arg Ala Ser Ala
        1155                1160                1165

Ala Gly Gly Ala Asp Gly Trp Arg Pro Arg Gly Thr Val Leu Val Val
    1170                1175                1180

Gly Asp Thr Ala Glu Val Ala Gly Pro Leu Val Arg Trp Leu Leu Gly
1185                1190                1195                1200

Asn Gly Ala Arg Arg Val Thr Leu Ser Gly Leu Ser Gly Pro Leu Pro
                1205                1210                1215

Glu Glu Leu Ala Asp Val Ala Ala Arg Val Thr Val Ala Pro Cys Asp
            1220                1225                1230

Pro Ala Asp Arg Pro Ala Leu Arg Thr Leu Leu Ala Glu Gln Ala Pro
        1235                1240                1245

Thr Ala Val Leu Val Ala Pro Pro Ala Val Pro Pro Thr Pro Leu Ala
    1250                1255                1260

Glu Met Thr Ala Glu Ala Leu Ala Ile Ala Leu Ser Ala Lys Thr Gly
1265                1270                1275                1280

Leu Val Asp Arg Leu Asp Ser Leu Leu Asp Glu Pro Asp Pro Leu Leu
                1285                1290                1295

Glu Asp Gly Glu Leu Asp Ala Phe Val Val Phe Ser Ser Val Ala Gly
            1300                1305                1310

Val Trp Gly Gly Ala Gly Gln Gly Gly Tyr Ala Ala Gly Thr Ala Tyr
        1315                1320                1325

Leu Asp Ala Leu Ala Glu Cys Arg Arg Ala Gly Gly Leu Pro Val Thr
    1330                1335                1340

Ser Val Ala Trp Thr Pro Trp Leu Gly Thr Pro Ala Ala Asp Ser Leu
1345                1350                1355                1360

Gly Glu Gln Met Ser Arg Ala Gly Ile Thr Pro Leu Asp Pro Ala Ala
                1365                1370                1375
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Ser Leu Asp Ala Leu Ala Arg Ala Val Gly Arg Arg Ala Gly Cys Val
1380 1385 1390

Thr Val Ala Asp Ile Asp Trp Glu Arg Phe Ala Ser Ala Tyr Thr Ala
1395 1400 1405

Thr Arg Pro Thr Pro Met Phe Asp Glu Val Pro Glu Val Arg Arg Ile
1410 1415 1420

Gln Ala Ala Trp Ala Glu Ala Glu Ala Asp Ala Ala Arg Ser Gly Ala
1425 1430 1435 1440

Gly Gly Asp Ser Gln Leu Leu Arg Ser Leu Arg Gly Arg Pro Glu Glu
1445 1450 1455

Ala Gln Leu Ala Glu Leu Leu Arg Leu Val Arg Thr His Ala Ala Ala
1460 1465 1470

Val Leu Gly Leu Gly Ser Pro Gly Ala Val Glu Ala Arg Arg Ser Phe
1475 1480 1485

Lys Asp Leu Gly Phe Asn Ser Val Thr Ala Val Glu Leu Arg Asn Arg
1490 1495 1500

Leu Lys Glu Ala Thr Gly Leu Arg Leu Glu Val Ser Leu Val Phe Asp
1505 1510 1515 1520

His Pro Asp Pro Ala Ser Leu Ala Arg His Leu Leu Asp Leu Ala Leu
1525 1530 1535

Gly Gln Glu Pro Glu Glu Thr Pro Arg Ala Phe Ala Leu Glu Pro Ala
1540 1545 1550

Pro Asn Gly Glu Pro Ile Ala Ile Val Ser Met Ala Cys Arg Met Pro
1555 1560 1565

Gly Gly Val Ser Thr Pro Glu Glu Leu Trp Arg Leu Leu Arg Asp Gly
1570 1575 1580

Lys Asp Ala Ile Gly Pro Phe Pro Ala Asn Arg Gly Trp Asp Leu Glu
1585 1590 1595 1600

Asn Leu Tyr Asp Pro Asp Pro Asp Ala Asp Gly Arg Thr Tyr Val Arg
1605 1610 1615

Glu Gly Gly Phe Leu His Glu Ala Pro Asp Phe Asp Pro Ser Phe Phe
1620 1625 1630

Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu
1635 1640 1645

Leu Leu Glu Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly Ile Asp Pro
1650 1655 1660

Ala Arg Leu Arg Gly Ser Arg Thr Gly Val Phe Val Gly Thr Asn Gly
1665 1670 1675 1680

Gln His Tyr Met Pro Leu Leu Gln Asn Gly Gly Asp Ser Phe Asp Gly
1685 1690 1695

Tyr Leu Gly Thr Gly Asn Ser Ala Ser Val Met Ser Gly Arg Leu Ser
1700 1705 1710

Tyr Val Phe Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys
1715 1720 1725

Ser Ala Ser Leu Val Ala Leu His Leu Ala Val Gln Ala Met Arg Arg
1730 1735 1740

Gly Glu Cys Asp Met Ala Leu Val Gly Gly Ala Thr Val Met Ser Thr
1745 1750 1755 1760

Pro Glu Met Leu Val Glu Phe Ser Arg Gln Arg Val Ile Ser Ala Asn
1765 1770 1775

Gly Arg Ser Arg Ala Phe Ala Ala Gly Ala Asp Gly Val Ala Leu Gly
1780 1785 1790

Glu Gly Val Gly Val Leu Leu Val Glu Arg Leu Ser Asp Ala Glu Arg
1795 1800 1805

Asn Gly His Pro Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln
1810 1815 1820

Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln
1825 1830 1835 1840

Arg Val Ile Arg Gln Ala Leu Ala Asp Ala Gly Leu Arg Pro Glu Asp
1845 1850 1855

Ile Asp Ala Val Glu Ala His Gly Thr Gly Thr Glu Leu Gly Asp Pro
1860 1865 1870

Ile Glu Ala Glu Ala Leu Leu Ala Thr Tyr Gly Arg Thr Arg Thr Ala
1875 1880 1885

Asp Arg Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Thr
1890 1895 1900

Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys Met Val Leu Ala Leu
1905 1910 1915 1920

Gly Asn Glu Thr Leu Pro Arg Thr Leu His Val Asp Glu Pro Thr Pro
1925 1930 1935

Arg Val Asp Trp Ser Ser Gly Ala Val Ser Leu Leu Thr Glu Pro Val
1940 1945 1950

Asp Trp Pro Ala Gly Pro Ser Ala Pro Arg Arg Ala Ala Val Ser Ser
1955 1960 1965

Phe Gly Ile Ser Gly Thr Asn Ala His Thr Ile Leu Glu Gln Ala Pro
1970 1975 1980

Val Pro Ala Glu Ser Arg Pro Gly Thr Glu Pro Ala Asp Gly Thr Gly
1985 1990 1995 2000

Ala Trp Glu Asn Val Thr Val Pro Leu Leu Leu Ser Gly His Thr Glu
2005 2010 2015

Ala Ala Leu Arg Glu Gln Ser Thr Arg Leu Leu Asn Asp Leu Leu Glu
2020 2025 2030

His Pro Asp Glu His Pro Ala Asp Val Gly Tyr Thr Leu Ile Thr Gly
2035 2040 2045

Arg Ala His Phe Gly His Arg Ala Ala Val Ile Gly Glu Ser Arg Glu
2050 2055 2060

Glu Leu Leu Asp Ala Leu Lys Ala Leu Ala Glu Gly Arg Glu His His
2065 2070 2075 2080

Thr Val Val Arg Gly Asp Gly Thr Ala His Pro Asp Arg Arg Val Val
2085 2090 2095

Phe Val Phe Pro Gly Gln Gly Ser Gln Trp Pro Ser Met Ala Arg Asp
2100 2105 2110

Leu Leu Asp Arg Ala Pro Ala Phe Arg Glu Thr Ala Lys Ala Cys Asp
2115 2120 2125

Ala Ala Leu Ser Val His Leu Asp Trp Ser Val Leu Asp Val Leu Gln
2130 2135 2140

Glu Lys Pro Asp Ala Pro Pro Leu Ser Arg Val Asp Val Val Gln Pro
2145 2150 2155 2160

Val Leu Phe Thr Met Met Leu Ser Leu Ala Ala Cys Trp Arg Asp Leu
2165 2170 2175

Gly Val His Pro Ala Ala Val Val Gly His Ser Gln Gly Glu Ile Ala
2180 2185 2190

Ala Ala Cys Val Ala Gly Ala Leu Ser Leu Glu Asp Ala Ala Arg Ile
2195 2200 2205

Val Ala Leu Arg Ser Arg Ala Trp Leu Thr Leu Ala Gly Lys Gly Gly
2210 2215 2220

Met Ala Ala Val Ser Leu Pro Glu Ala Arg Leu Arg Glu Arg Ile Glu
2225 2230 2235 2240

Arg Phe Gly Gln Arg Leu Ser Val Ala Ala Val Asn Ser Pro Gly Thr
2245 2250 2255

Ala Ala Val Ala Gly Asp Val Asp Ala Leu Arg Glu Leu Leu Ala Glu
2260 2265 2270

Leu Thr Ala Glu Gly Ile Arg Ala Lys Pro Ile Pro Gly Val Asp Thr
2275 2280 2285

Ala Gly His Ser Ala Gln Val Asp Gly Leu Lys Glu His Leu Phe Glu
2290 2295 2300

Val Leu Ala Pro Val Ser Pro Arg Ser Ser Asp Ile Pro Phe Tyr Ser
2305 2310 2315 2320

Thr Val Thr Gly Ala Pro Leu Asp Thr Glu Arg Leu Asp Ala Gly Tyr
2325 2330 2335

Trp Tyr Arg Asn Met Arg Glu Pro Val Glu Phe Glu Lys Ala Val Arg
2340 2345 2350

Ala Leu Ile Ala Asp Gly Tyr Asp Leu Phe Leu Glu Cys Asn Pro His
2355 2360 2365

Pro Met Leu Ala Met Ser Leu Asp Glu Thr Leu Thr Asp Ser Gly Gly
2370 2375 2380

His Gly Thr Val Met His Thr Leu Arg Arg Gln Lys Gly Ser Ala Lys
2385 2390 2395 2400

Asp Phe Gly Met Ala Leu Cys Leu Ala Tyr Val Asn Gly Leu Glu Ile
2405 2410 2415

Asp Gly Glu Ala Leu Phe Gly Pro Asp Ser Arg Arg Val Asn Pro Pro
2420 2425 2430

Thr Tyr Pro Phe Gln Arg Glu Arg Tyr Trp Tyr His Pro Thr Ser Gly
2435 2440 2445

Arg Arg Gly Asp Ile Thr Ala Ala Gly Val Ala Glu Ala Glu His Pro
2450 2455 2460

Leu Leu Gly Ala Gly Val Glu Leu Pro Glu Thr Gly Gly Thr Val Tyr
2465 2470 2475 2480

Thr Ala Arg Phe Gly Pro Asp Ser Arg Pro Trp Leu Ala Asp His Ala
2485 2490 2495

Leu Leu Gly Thr Val Leu Leu Pro Gly Thr Ala Ile Leu Asp Leu Val
2500 2505 2510

Leu Trp Ala Gly Glu Arg Ser Gly Cys Gly Arg Val Gly Glu Leu Ala
2515 2520 2525

Leu Gln Ala Pro Leu Val Leu Pro Asp Ser Gly Asp Val Glu Leu Arg
2530 2535 2540

Leu Leu Val Gly Gly Pro Asp Glu Glu Lys Arg Arg Thr Val Thr Val
2545 2550 2555 2560

His Ala Arg Pro Ala Ala Ala Gly Ala Glu Ala Pro Trp Thr Arg His
2565 2570 2575

Ala Glu Ala Val Val Leu Pro Ala Thr Gly Glu Glu Pro Thr Pro Ala
2580 2585 2590

Pro Arg Pro Val Pro Glu Pro Ala Gly Thr Thr Asp Pro Ala Ala Phe
2595 2600 2605

Tyr Ala Glu Phe Ala Glu Arg Gly Tyr Asp Tyr Gly Pro Ala Phe Gln
2610 2615 2620

Gly Phe Thr Ala Gly Ala Arg His Gly Glu Asp Val Val Ala Glu Val
2625 2630 2635 2640

Ala Leu Pro Ser Gly Leu Val Ala Asp Ala Arg His His Arg Leu His
2645 2650 2655

Pro Ala Leu Leu Asp Ala Ala Leu Gln Ala Met Ile Leu Gly Thr Phe
2660 2665 2670

Phe Ala Asp Asp Gly Arg Ala Arg Met Pro Phe Ala Val Arg Gly Val
2675 2680 2685

Arg Leu His Thr Ala Gly Ala Asp Arg Leu Arg Val Leu Ile Ser Pro
2690 2695 2700

Ala Gly Asp Glu Thr Val Arg Leu Leu Cys Thr Asp Leu Ala Thr Gly
2705 2710 2715 2720

Ala Pro Val Leu Glu Ile Asp Glu Leu Val Val Arg Pro Val Ser Gly
2725 2730 2735

Glu Gln Leu Ala Ala Gly Ala Pro Gly Arg Asn Gly Gly Glu Leu Tyr
2740 2745 2750

Arg Val Asp Trp Thr Val Leu Pro Glu Pro Ala Glu Val Pro Ala Pro
2755 2760 2765

Arg Trp Ala Leu Leu Gly Glu Asp His Ala Gly Leu Ala Asp Val Leu
2770 2775 2780

Gly Gly Thr Gly Gly Gly Cys Glu Arg Tyr Asp Thr Leu Thr Gly Leu
2785 2790 2795 2800

Leu Glu Ala Thr Thr Arg Ser Ala Gly Gly Ile Leu Pro Asp Ile Val
2805 2810 2815

Ala Leu Ser Leu Pro Thr Ala Pro Glu Pro Gly Pro Gln Ala Val Arg
2820 2825 2830

Glu Val Leu Ser Gln Ala Leu Asp Ala Ala Gln Ala Trp Leu Ala Ala
2835 2840 2845

Gly Ala Glu Thr Ala Ser Ala Arg Leu Val Phe Val Thr Gly Gly Ala
2850 2855 2860

Val Ala Thr Thr Ala Asp Glu Thr Val Arg Asp Ile Ala Ala Ala Ala
2865 2870 2875 2880

Val Trp Gly Leu Val Arg Ser Ala Gln Ser Glu Glu Pro Asp Arg Met
2885 2890 2895

Val Leu Leu Asp Leu Asp Gly Glu Arg Pro Thr Ala Arg Thr Leu Ala
2900 2905 2910

Ala Ala Leu Ala Ser Gly Glu Pro Gln Leu Ala Val Arg Gly Ser Thr
2915 2920 2925

Val Ala Ala Pro Arg Leu Ala Pro Ala Gly Pro Gly Pro Glu Asp Leu
2930 2935 2940

Val Pro Pro Ala Gly Thr Thr Ala Trp Arg Leu Thr Pro Gly Gly Gly
2945 2950 2955 2960

Thr Leu Glu Glu Leu Ser Leu Ala Pro Ala Pro Asp Ala Glu Glu Pro
2965 2970 2975

Leu Ala Pro Gly Gln Val Arg Ile Ala Val Arg Ala Ala Gly Val Asn
2980 2985 2990

Phe Arg Asp Ala Leu Ile Ala Leu Gly Met Tyr Pro Gly Lys Gly Thr
2995 3000 3005

Met Gly Ala Glu Gly Ala Gly Val Val Val Glu Thr Ala Pro Asp Val
3010 3015 3020

Thr Gly Leu Ser Ala Gly Asp Arg Val Leu Gly Met Trp Asn Gly Gly
3025 3030 3035 3040

Phe Gly Pro Leu Val Val Ala Asp His Arg Met Val Ala Pro Ile Pro
3045 3050 3055

His Gly Trp Ser Tyr Ala Glu Ala Ala Ser Val Pro Ala Val Leu Leu
3060 3065 3070

Thr Ser Tyr Tyr Ala Leu Thr Arg Leu Ala Arg Ala Arg Thr Gly Gln
3075 3080 3085

Thr Val Leu Val His Ala Ala Ala Gly Gly Val Gly Met Ala Thr Leu
3090 3095 3100

Gln Leu Ala Arg His Leu Gly Leu Glu Val Tyr Ala Thr Ala Ser Thr
3105 3110 3115 3120

Gly Lys Trp Asp Ala Leu Gln Lys His Gly Ile Pro Asp Asp Arg Ile
3125 3130 3135

Ala Asp Ser Arg Thr Leu Asp Phe Ala Glu Arg Phe Leu Ser Arg Thr
3140 3145 3150

Gly Gly Arg Gly Val Asp Ile Val Leu Asn Ser Leu Ala Gly Glu Phe
3155 3160 3165

Val Asp Ala Ser Leu Arg Leu Leu Pro Arg Gly Gly His Phe Leu Glu
3170 3175 3180

Leu Gly Lys Ala Asp Val Arg Asp Pro Arg Arg Ile Ala Ala Ala His
3185 3190 3195 3200

Pro Gly Thr Asp Tyr Arg Ala Phe Asp Leu Val Gln Ala Gly Pro Asp
3205 3210 3215

Thr Val Gly Glu Met Leu Gly Glu Leu Leu Glu Leu Phe Ala Ala Gly
3220 3225 3230

Ala Leu Arg Pro Leu Pro Leu Thr Ala Tyr Gly Ile Arg Asp Ala Arg
3235 3240 3245

Thr Ala Leu Arg Thr Leu Ser Gln Ala Arg His Thr Gly Lys Leu Val
3250 3255 3260

Leu Thr Val Pro Ala Gly Phe Asp Thr His Arg Thr Val Leu Leu Thr
3265 3270 3275 3280

Gly Gly Thr Gly Thr Leu Gly Gln Thr Leu Ala Arg His Leu Val Asn
3285 3290 3295

Arg His Gly Val Arg His Leu Leu Leu Ala Gly Arg Thr Gly Ala Ala
3300 3305 3310

Ala Glu Gly Val Ala Glu Leu Ile Gly Glu Leu Gly Glu Leu Gly Ala
3315 3320 3325

Glu Val Arg Val Ala Ala Cys Asp Ala Ala Asp Arg Gln Arg Leu Thr
3330 3335 3340

Glu Leu Leu Ala Gly Ile Pro Val Glu His Pro Leu Gly Ala Val Val
3345 3350 3355 3360

His Ala Ala Gly Thr Leu Asp Asp Gly Thr Ile Pro Ser Leu Thr Gly
3365 3370 3375

Glu Asn Ile Asp Asn Val Leu Arg Pro Lys Ala Asp Ala Val Leu Asn
3380 3385 3390

Leu His Glu Leu Thr Arg Asp Ala Asp Leu Ser Ala Phe Val Leu Tyr
3395 3400 3405

Ser Ser Ser Ser Ala Leu Leu Gly Ser Pro Gly Gln Gly Ala Tyr Ala
3410 3415 3420

Ala Ala Asn Ala Phe Leu Asp Gly Phe Ala Arg Tyr Arg Lys Gly Leu
3425 3430 3435 3440

Gly Leu Pro Ala Leu Ser Leu Ala Trp Gly Leu Trp Gly Ser Asn Ser
3445 3450 3455

Arg Met Ala Gly His Leu Asp Gln Ser Gly Met Gln Arg Arg Leu Asn
3460 3465 3470

Arg Ser Gly Ile Met Ala Leu Thr Asp Ala Glu Gly Leu Ala Leu Phe
3475 3480 3485

Asp Ala Ala Gln Asp Gly Gly Asp Ala Leu Leu Val Pro Met Arg Leu
3490 3495 3500

Asn Arg Thr Ala Leu Arg Ala Ser Gly Arg Ile Thr Pro Phe Leu Ser
3505 3510 3515 3520

Gly Leu Ala Gly Gly Gly Pro Ala Ala Gly Glu Arg Arg Pro Glu Val
3525 3530 3535

Ala Ala Val Ser Gly Thr Leu Ala Glu Arg Leu Thr Gly Leu Thr Ala
3540 3545 3550

Gln Glu Gly His Ala Leu Val Leu Ala Glu Ile Arg Ala His Ala Ala
3555 3560 3565

Ala Val Leu Gly His Gly Ser Asp Asp Ser Ile Pro Glu Asp Arg Ala
3570 3575 3580

Phe Lys Asp Leu Gly Phe Asp Ser Leu Thr Ala Val Glu Met Arg Asn
3585 3590 3595 3600

Arg Leu Ser Ala Ala Thr Gly Leu Arg Leu Pro Ala Thr Leu Val Phe
3605 3610 3615

```
Asp His Pro Thr Pro Gly Glu Leu Ala Gly His Leu Ser Ala Glu Leu
            3620                3625                3630

Ser Ala Asp Asp Ala Pro Gly Ser Ala Ser Pro Leu Thr Glu Leu Asp
        3635                3640                3645

Arg Phe Glu Ala Leu Phe Thr Ala Leu Ala Pro Gly Thr Thr Lys Asp
    3650                3655                3660

Thr Pro Gly Gly Ala Gly Ala Leu Met Ile Asp Glu Ala Glu Arg Gln
3665                3670                3675                3680

Glu Ile Ala Gly Arg Leu Ala Ala Leu Ala Gly Leu Trp Asn Arg Leu
                3685                3690                3695

His Gly Thr Thr Thr Ala Pro Glu Asp Gly Asp Thr Val Ala Asp Ala
            3700                3705                3710

Leu Glu Ala Ala Asp Asp His Glu Ile Phe Ala Phe Leu Asp Glu Arg
        3715                3720                3725

Phe  *
     3730
```

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1612 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

```
Met Ala Asn Ala Asn Glu Gln Gln Leu Arg Ala Tyr Leu Lys Arg Ala
1               5                   10                  15

Thr Thr Glu Leu His Arg Thr Ser Glu Gln Leu Arg Glu Glu Arg Ala
            20                  25                  30

Arg Ala His Glu Pro Ile Ala Val Val Gly Met Ala Cys Arg Tyr Pro
        35                  40                  45

Gly Gly Ala Asn Thr Pro Glu Gln Phe Trp Glu Leu Leu Asp Thr Gly
    50                  55                  60

Thr Asp Ala Ala Ala Pro Met Pro Ser Asp Arg Gly Trp Asp Thr His
65                  70                  75                  80

Gly Leu Tyr Asp Pro Asp Pro Ala Ala Ala Gly Arg Thr Tyr Cys Arg
                85                  90                  95

Glu Gly Gly Phe Leu His Asp Ala Gly Asp Phe Asp Ala Asp Phe Phe
            100                 105                 110

Gly Ile Ser Pro Arg Glu Ala Val Ala Met Asp Pro Gln Gln Arg Leu
        115                 120                 125
```

```
Leu Leu Glu Thr Ser Trp Glu Ala Ile Glu Ala Ala Gly Ile Asp Pro
    130                 135                 140

Arg Gly Leu Arg Gly Ser Arg Thr Gly Val Tyr Val Gly Ala Trp Asp
145                 150                 155                 160

Ser Gly Tyr Thr Gly Gln Ala His Ala Pro Ser Ala Glu Leu Glu Ala
                165                 170                 175

Asp Leu Leu Thr Gly Gly Val Val Ser Phe Thr Ser Gly Arg Ile Ala
            180                 185                 190

Tyr Thr Leu Gly Leu Glu Gly Pro Ala Leu Thr Val Asp Thr Ala Cys
        195                 200                 205

Ser Ser Ser Leu Val Ala Leu His Asn Ala Ala Gln Ala Leu Arg Arg
    210                 215                 220

Gly Glu Cys Asp Leu Ala Leu Ala Gly Gly Val Thr Val Met Ala Thr
225                 230                 235                 240

Pro Ala Val Phe Val Gln Phe Ala Arg Gln Arg Gly Leu Ala Pro Asp
                245                 250                 255

Gly Arg Cys Lys Ala Phe Ala Asp Ala Ala Asp Gly Phe Gly Pro Ala
            260                 265                 270

Glu Gly Val Gly Met Val Leu Val Glu Arg Leu Ser Asp Ala Arg Arg
        275                 280                 285

Leu Gly His Pro Val Leu Ala Val Val Cys Gly Ser Ala Val Asn Gln
    290                 295                 300

Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Ser Gly Pro Ser Gln Glu
305                 310                 315                 320

Arg Val Ile Arg Gln Ala Leu Gly Asn Ala Arg Leu Thr Val Ala Asp
                325                 330                 335

Val Asp Val Val Glu Ala His Gly Thr Gly Thr Arg Leu Gly Asp Pro
            340                 345                 350

Ile Glu Ala Gln Ala Leu Leu Gly Thr Tyr Gly Arg Asp Arg Asp Gly
        355                 360                 365

Gly Arg Pro Val Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Ala
    370                 375                 380

Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys Met Val Leu Ala Met
385                 390                 395                 400

Arg Tyr Gly Trp Leu Pro Arg Thr Leu His Val Asp Glu Pro Ser Arg
                405                 410                 415

His Val Asp Trp Ser Ala Gly Gly Val Arg Leu Leu Thr Glu Ala Arg
            420                 425                 430

Glu Trp Pro Gly Val Asp Arg Pro Arg Arg Ala Ala Val Ser Ala Phe
        435                 440                 445
```

```
Gly Val Ser Gly Thr Asn Ala His Leu Ile Leu Glu Ala Pro Asp Thr
    450                 455                 460

Ala Glu Ala Glu Ser Ala Thr Thr Pro Val Arg Ser Glu Val Ser Glu
465                 470                 475                 480

Ser Ala Ala Val Leu Asp Ala Arg Ser Gly Val Val Pro Val Val Val
                485                 490                 495

Ser Gly Arg Ser Arg Val Val Val Arg Glu Ala Ala Gly Arg Leu Ala
            500                 505                 510

Glu Val Val Glu Ala Gly Gly Val Gly Leu Ala Asp Val Ala Val Thr
        515                 520                 525

Met Ala Gly Arg Ser Arg Phe Gly Tyr Arg Ala Val Val Leu Ala Arg
    530                 535                 540

Gly Glu Ala Glu Leu Ala Gly Arg Leu Arg Ala Leu Ala Gly Gly Asp
545                 550                 555                 560

Pro Asp Ala Gly Val Val Thr Gly Ala Val Val Asp Pro Glu Thr Gly
                565                 570                 575

Ser Gly Gly Gly Gly Gly Val Val Leu Val Phe Pro Gly Gln Gly Thr Gln
            580                 585                 590

Trp Val Gly Met Gly Ala Gly Leu Leu Gly Ser Ser Glu Val Phe Ala
        595                 600                 605

Ala Ser Met Arg Glu Cys Ala Arg Ala Leu Ser Val His Val Gly Trp
    610                 615                 620

Asp Leu Leu Glu Val Val Ser Gly Gly Ala Gly Leu Glu Arg Val Asp
625                 630                 635                 640

Val Val Gln Pro Val Thr Trp Ala Val Met Val Ser Leu Ala Arg Tyr
                645                 650                 655

Trp Gln Ala Met Gly Val Asp Val Ala Ala Val Val Gly His Ser Gln
            660                 665                 670

Gly Glu Ile Ala Ala Ala Thr Val Ala Gly Ala Leu Ser Leu Glu Asp
        675                 680                 685

Ala Ala Ala Val Val Ala Leu Arg Ala Gly Leu Ile Gly Arg Tyr Leu
    690                 695                 700

Ala Gly Arg Gly Ala Met Ala Ala Val Pro Leu Pro Ala Gly Glu Val
705                 710                 715                 720

Glu Ala Gly Leu Ala Lys Trp Pro Gly Val Glu Val Ala Ala Val Asn
                725                 730                 735

Gly Pro Ala Ser Thr Val Val Ser Gly Asp Arg Arg Ala Val Ala Gly
            740                 745                 750

Tyr Val Ala Val Cys Gln Ala Glu Gly Val Gln Ala Arg Leu Ile Pro
        755                 760                 765
```

```
Val Asp Tyr Ala Ser His Ser Arg His Val Glu Asp Leu Lys Gly Glu
    770                 775                 780

Leu Glu Arg Val Leu Ser Gly Ile Arg Pro Arg Ser Pro Arg Val Pro
785                 790                 795                 800

Val Cys Ser Thr Val Ala Gly Glu Gln Pro Gly Glu Pro Val Phe Asp
                805                 810                 815

Ala Gly Tyr Trp Phe Arg Asn Leu Arg Asn Arg Val Glu Phe Ser Ala
            820                 825                 830

Val Val Gly Gly Leu Leu Glu Glu Gly His Arg Arg Phe Ile Glu Val
        835                 840                 845

Ser Ala His Pro Val Leu Val His Ala Ile Glu Gln Thr Ala Glu Ala
    850                 855                 860

Ala Asp Arg Ser Val His Ala Thr Gly Thr Leu Arg Arg Gln Asp Asp
865                 870                 875                 880

Ser Pro His Arg Leu Leu Thr Ser Thr Ala Glu Ala Trp Ala His Gly
                885                 890                 895

Ala Thr Leu Thr Trp Asp Pro Ala Leu Pro Pro Gly His Leu Thr Thr
            900                 905                 910

Leu Pro Thr Tyr Pro Phe Asn His His His Tyr Trp Leu Asp Thr Thr
        915                 920                 925

Pro Thr Thr Pro Ala Thr Thr Thr Gln Ser Pro Thr Asp Ala Trp Arg
    930                 935                 940

Tyr Arg Val Thr Trp Lys Ala Leu Thr Glu Glu Ser Thr Pro Ala Ser
945                 950                 955                 960

Ser Pro Ser Gly His Trp Leu Leu Val Thr Pro Pro Thr Pro Glu Gly
                965                 970                 975

Arg Thr Leu Gly Asp Arg Ala Ala Gly Ala Leu Ala Arg Gln Gly Ala
            980                 985                 990

Thr Val Glu Arg Leu Val Val Asp Pro Val Ala Val Gly Arg Asp Gly
        995                 1000                1005

Leu Ala Ala Arg Leu Gly Glu Arg Trp Asp Gly Val Leu Ser Leu Leu
    1010                1015                1020

Gly Ala Asp Glu Arg Pro Leu Pro Arg His Pro Ala Leu Asn Arg Ala
1025                1030                1035                1040

Val Met Gly Thr Thr Leu Leu Ala Gln Ala Ala Leu Asp Ala Gly Cys
                1045                1050                1055

Glu Ala Arg Ile Trp Ala Val Thr Arg Glu Ala Val Ala Val Ser Pro
            1060                1065                1070

Ser Glu Val Pro Arg Asp Ala Gly Ala Gln Leu Trp Gly Leu Gly Arg
        1075                1080                1085
```

```
Gly Ile Ala Leu Glu His Pro Ser Leu Trp Gly Gly Leu Ile Asp Leu
    1090                1095                1100

Pro Ala Val Pro Asp Glu Arg Ala Trp Ala Arg Ala Val Arg Arg Leu
1105                1110                1115                1120

Val Pro His Gly Glu Asp Gln Ile Ala Ala Arg Ala Ser Gly Ala Tyr
                1125                1130                1135

Gly Arg Arg Leu Leu Pro Ala Pro Pro Ala Ala Ser Arg Arg Thr Cys
            1140                1145                1150

Thr Pro Ser Gly Thr Val Leu Val Thr Gly Gly Thr Gly Ala Leu Gly
        1155                1160                1165

Gly His Leu Ala Arg Arg Leu Ala Arg Gly Gly Thr Gly His Leu Val
    1170                1175                1180

Leu Thr Ser Arg Arg Gly Pro Asp Ala Pro Gly Ala Gly Glu Leu Ala
1185                1190                1195                1200

Gly Glu Leu Ala Ser Leu Gly Ala Lys Val Thr Val Ala Ala Cys Asp
                1205                1210                1215

Met Ala Asp Arg Glu Ala Val Arg Ala Leu Leu Asp Glu His Arg Pro
            1220                1225                1230

Thr Ala Val Phe His Thr Ala Gly Thr Pro His Ser Ala Glu Phe Thr
        1235                1240                1245

Ala Leu Asp Glu Thr Thr Thr Ala Gly Val Tyr Gly Gly Lys Val Leu
    1250                1255                1260

Gly Ala Arg His Leu Asp Glu Leu Thr Arg Glu Leu Gly Ile Gly Leu
1265                1270                1275                1280

Asp Ala Phe Val Leu Phe Ser Ser Gly Ala Ala Val Trp Gly Ser Gly
                1285                1290                1295

Gly Gln Thr Ala Tyr Gly Ala Ala Asn Ala Ala Leu Asp Ala Leu Ala
            1300                1305                1310

Glu Arg Arg Arg Ala Ala Gly Leu Pro Ala Thr Ser Val Ala Trp Gly
        1315                1320                1325

Leu Trp Gly Gly Gly Gly Met Gly Glu Gly Asp Gly Glu Glu Phe Leu
    1330                1335                1340

Ser Arg Arg Gly Leu Gly Val Met Pro Pro Glu Asp Ala Leu Glu Ala
1345                1350                1355                1360

Leu Asp Arg Ala Leu Asp Arg Glu Asp Thr Thr Val Val Val Ala Asp
                1365                1370                1375

Val Asp Trp Glu Arg Phe Ala Pro Ala Phe Thr Ala Phe Arg Pro Ser
            1380                1385                1390

Ala Leu Ile Ser Arg Leu Val Ser Asp Gly Gly Glu Ala Gly Gly Gln
        1395                1400                1405
```

```
Asp Ala Pro Asp Gly Thr Leu Phe Ala Ala Gly Phe Ala Ala Ala Gly
    1410                1415                1420

Pro Leu Glu Arg Gln Glu Met Leu Leu Gly Leu Val Arg Arg His Val
1425                1430                1435                1440

Ala Ala Val Leu Gly His Pro Gly Thr Ala Asp Ile Gly Pro Asp Arg
                1445                1450                1455

Ala Phe Lys Glu Leu Gly Phe Ser Ser Val Thr Ala Val Glu Leu Ala
            1460                1465                1470

Gly Arg Leu Gly Arg Glu Cys Gly Arg Lys Leu Pro Pro Thr Leu Val
        1475                1480                1485

Phe Asp His Pro Thr Ala Ala Ala Ala Val Glu His Leu Ala Glu Leu
    1490                1495                1500

Leu Thr Pro Pro Ala Gly Pro Ala Ala Gly Pro Arg Glu Glu Glu Ala
1505                1510                1515                1520

Arg Ala Ala Leu Ala Arg Val Pro Leu Glu Arg Leu Arg Glu Ala Gly
                1525                1530                1535

Leu Leu Asp Ala Leu Leu Arg Leu Ala Ala Asp Glu Ser Gly Ala Thr
            1540                1545                1550

Thr Pro Arg Thr Ser Ala Ala Ser Gly Ala Pro Arg Gly Arg Glu Glu
        1555                1560                1565

Pro Asp Gly Arg Gly Glu Pro Asp Gly Ser Gly His Arg Glu Ser Pro
    1570                1575                1580

Asp Ala Ala Gly Gly Ser Asp Ala Leu Asp Asp Leu Asp Gly Asp Ala
1585                1590                1595                1600

Leu Val Arg Leu Ala Leu Gly Glu Pro Gly Glu  *
                1605                1610
```

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1842 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

```
Met Ala Met Ser Ala Glu Arg Leu Thr Glu Ala Leu Arg Thr Ser Leu
1               5                   10                  15

Lys Glu Ala Glu Arg Leu Arg Arg Gln Asn Arg Glu Leu Arg Ala Ala
            20                  25                  30

Arg Asp Ala Ala Arg Glu Pro Ile Ala Val Val Gly Met Ala Cys Arg
        35                  40                  45
```

```
Tyr Pro Gly Gly Val Thr Gly Pro Glu Glu Leu Trp Glu Leu Val Ala
 50                  55                  60

Gly Gly Arg Asp Ala Ile Gly Pro Phe Pro Val Asp Arg Gly Trp Asp
65                  70                  75                  80

Val Ala Ser Val Tyr Asp Pro Asp Pro Glu Ser Lys Gly Thr Thr Tyr
                85                  90                  95

Cys Arg Glu Gly Gly Phe Leu Glu Gly Ala Gly Asp Phe Asp Ala Ala
            100                 105                 110

Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu Val Met Asp Pro Gln Gln
        115                 120                 125

Arg Leu Leu Leu Glu Val Ser Trp Glu Ala Leu Glu Arg Ala Gly Ile
    130                 135                 140

Asp Pro Ser Ser Leu Arg Gly Ser Arg Gly Gly Val Tyr Val Gly Ala
145                 150                 155                 160

Ala His Gly Ser Tyr Ala Ser Asp Pro Arg Leu Val Pro Glu Gly Ser
                165                 170                 175

Glu Gly Tyr Leu Leu Thr Gly Ser Ala Asp Ala Val Met Ser Gly Arg
            180                 185                 190

Ile Ser Tyr Ala Leu Gly Leu Glu Gly Pro Ser Met Thr Val Glu Thr
        195                 200                 205

Ala Cys Ser Ser Ser Leu Val Ala Leu His Leu Ala Val Arg Ala Leu
    210                 215                 220

Arg His Gly Glu Cys Gly Leu Ala Leu Ala Gly Gly Val Ala Val Met
225                 230                 235                 240

Ala Asp Pro Ala Ala Phe Val Glu Phe Ser Arg Gln Lys Gly Leu Ala
                245                 250                 255

Ala Asp Gly Arg Cys Lys Ala Phe Ser Ala Ala Ala Asp Gly Thr Gly
            260                 265                 270

Trp Ala Glu Gly Val Gly Val Leu Val Leu Glu Arg Leu Ser Asp Ala
        275                 280                 285

Arg Arg Ala Gly His Thr Val Leu Gly Leu Val Thr Gly Thr Ala Val
    290                 295                 300

Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ala
305                 310                 315                 320

Gln Gln Arg Val Ile Ala Glu Ala Leu Ala Asp Ala Gly Leu Ser Pro
                325                 330                 335

Glu Asp Val Asp Ala Val Glu Ala His Gly Thr Gly Thr Arg Leu Gly
            340                 345                 350

Asp Pro Ile Glu Ala Gly Ala Leu Leu Ala Ala Ser Gly Arg Asn Arg
        355                 360                 365
```

```
Ser Gly Asp His Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly
    370                 375                 380

His Ala Gln Ala Ala Ala Gly Val Gly Gly Val Ile Lys Met Leu Gln
385                 390                 395                 400

Ala Leu Arg His Gly Leu Leu Pro Arg Thr Leu His Ala Asp Glu Pro
                405                 410                 415

Thr Pro His Ala Asp Trp Ser Ser Gly Arg Val Arg Leu Leu Thr Ser
            420                 425                 430

Glu Val Pro Trp Gln Arg Thr Gly Arg Pro Arg Arg Thr Gly Val Ser
        435                 440                 445

Ala Phe Gly Val Gly Gly Thr Asn Ala His Val Val Leu Glu Glu Ala
    450                 455                 460

Pro Ala Pro Pro Ala Pro Glu Pro Ala Gly Glu Ala Pro Gly Gly Ser
465                 470                 475                 480

Arg Ala Ala Glu Gly Ala Glu Gly Pro Leu Ala Trp Val Val Ser Gly
                485                 490                 495

Arg Asp Glu Pro Ala Leu Arg Ser Gln Ala Arg Arg Leu Arg Asp His
            500                 505                 510

Leu Ser Arg Thr Pro Gly Ala Arg Pro Arg Asp Ile Ala Phe Ser Leu
        515                 520                 525

Ala Ala Thr Arg Ala Ala Phe Asp His Arg Ala Val Leu Ile Gly Ser
    530                 535                 540

Asp Gly Ala Glu Leu Ala Ala Ala Leu Asp Ala Leu Ala Glu Gly Arg
545                 550                 555                 560

Asp Gly Pro Ala Val Val Arg Gly Val Arg Asp Arg Asp Gly Arg Met
                565                 570                 575

Ala Phe Leu Phe Thr Gly Gln Gly Ser Gln Arg Ala Gly Met Ala His
            580                 585                 590

Asp Leu His Ala Ala His Thr Phe Phe Ala Ser Ala Leu Asp Glu Val
        595                 600                 605

Thr Asp Arg Leu Asp Pro Leu Leu Gly Arg Pro Leu Gly Ala Leu Leu
    610                 615                 620

Asp Ala Arg Pro Gly Ser Pro Glu Ala Ala Leu Leu Asp Arg Thr Glu
625                 630                 635                 640

Tyr Thr Gln Pro Ala Leu Phe Ala Val Glu Val Ala Leu His Arg Leu
                645                 650                 655

Leu Glu His Trp Gly Met Arg Pro Asp Leu Leu Leu Gly His Ser Val
            660                 665                 670

Gly Glu Leu Ala Ala Ala His Val Ala Gly Val Leu Asp Leu Asp Asp
        675                 680                 685
```

```
Ala Cys Ala Leu Val Ala Ala Arg Gly Arg Leu Met Gln Arg Leu Pro
    690                 695                 700

Pro Gly Gly Ala Met Val Ser Val Arg Ala Gly Glu Asp Glu Val Arg
705                 710                 715                 720

Ala Leu Leu Ala Gly Arg Glu Asp Ala Val Cys Val Ala Ala Val Asn
                725                 730                 735

Gly Pro Arg Ser Val Val Ile Ser Gly Ala Glu Glu Ala Val Ala Glu
            740                 745                 750

Ala Ala Ala Gln Leu Ala Gly Arg Gly Arg Arg Thr Arg Arg Leu Arg
        755                 760                 765

Val Ala His Ala Phe His Ser Pro Leu Met Asp Gly Met Leu Ala Gly
    770                 775                 780

Phe Arg Glu Val Ala Ala Gly Leu Arg Tyr Arg Glu Pro Glu Leu Thr
785                 790                 795                 800

Val Val Ser Thr Val Thr Gly Arg Pro Ala Arg Pro Gly Glu Leu Thr
                805                 810                 815

Gly Pro Asp Tyr Trp Val Ala Gln Val Arg Glu Pro Val Arg Phe Ala
            820                 825                 830

Asp Ala Val Arg Thr Ala His Arg Leu Gly Ala Arg Thr Phe Leu Glu
        835                 840                 845

Thr Gly Pro Asp Gly Val Leu Cys Gly Met Ala Glu Glu Cys Leu Glu
    850                 855                 860

Asp Asp Thr Val Ala Leu Leu Pro Ala Ile His Lys Pro Gly Thr Ala
865                 870                 875                 880

Pro His Gly Pro Ala Ala Pro Gly Ala Leu Arg Ala Ala Ala Ala Ala
                885                 890                 895

Tyr Gly Arg Gly Ala Arg Val Asp Trp Ala Gly Met His Ala Asp Gly
            900                 905                 910

Pro Glu Gly Pro Ala Arg Arg Val Glu Leu Pro Val His Ala Phe Arg
        915                 920                 925

His Arg Arg Tyr Trp Leu Ala Pro Gly Arg Ala Ala Asp Thr Asp Asp
    930                 935                 940

Trp Met Tyr Arg Ile Gly Trp Asp Arg Leu Pro Ala Val Thr Gly Gly
945                 950                 955                 960

Ala Arg Thr Ala Gly Arg Trp Leu Val Ile His Pro Asp Ser Pro Arg
                965                 970                 975

Cys Arg Glu Leu Ser Gly His Ala Glu Arg Ala Leu Arg Ala Ala Gly
            980                 985                 990

Ala Ser Pro Val Pro Leu Pro Val Asp Ala Pro Ala Ala Asp Arg Ala
        995                 1000                1005
```

```
Ser Phe Ala Ala Leu Leu Arg Ser Ala Thr Gly Pro Asp Thr Arg Gly
    1010                1015                1020

Asp Thr Ala Ala Pro Val Ala Gly Val Leu Ser Leu Leu Ser Glu Glu
1025                1030                1035                1040

Asp Arg Pro His Arg Gln His Ala Pro Val Pro Ala Gly Val Leu Ala
                1045                1050                1055

Thr Leu Ser Leu Met Gln Ala Met Glu Glu Glu Ala Val Glu Ala Arg
            1060                1065                1070

Val Trp Cys Val Ser Arg Ala Ala Val Ala Ala Ala Asp Arg Glu Arg
        1075                1080                1085

Pro Val Gly Ala Gly Ala Ala Leu Trp Gly Leu Gly Arg Val Ala Ala
    1090                1095                1100

Leu Glu Arg Pro Thr Arg Trp Gly Gly Leu Val Asp Leu Pro Ala Ser
1105                1110                1115                1120

Pro Gly Ala Ala His Trp Ala Ala Ala Val Glu Arg Leu Ala Gly Pro
                1125                1130                1135

Glu Asp Gln Ile Ala Val Arg Ala Ser Gly Ser Trp Gly Arg Arg Leu
            1140                1145                1150

Thr Arg Leu Pro Arg Asp Gly Gly Gly Arg Thr Ala Ala Pro Ala Tyr
        1155                1160                1165

Arg Pro Arg Gly Thr Val Leu Val Thr Gly Gly Thr Gly Ala Leu Gly
    1170                1175                1180

Gly His Leu Ala Arg Trp Leu Ala Ala Ala Gly Ala Glu His Leu Ala
1185                1190                1195                1200

Leu Thr Ser Arg Arg Gly Pro Asp Ala Pro Gly Ala Ala Gly Leu Glu
                1205                1210                1215

Ala Glu Leu Leu Leu Leu Gly Ala Lys Val Thr Phe Ala Ala Cys Asp
            1220                1225                1230

Thr Ala Asp Arg Asp Gly Leu Ala Arg Val Leu Arg Ala Ile Pro Glu
        1235                1240                1245

Asp Thr Pro Leu Thr Ala Val Phe His Ala Ala Gly Val Pro Gln Val
    1250                1255                1260

Thr Pro Leu Ser Arg Thr Ser Pro Glu His Phe Ala Asp Val Tyr Ala
1265                1270                1275                1280

Gly Lys Ala Ala Gly Ala Ala His Leu Asp Glu Leu Thr Arg Glu Leu
                1285                1290                1295

Gly Ala Gly Leu Asp Ala Phe Val Leu Tyr Ser Ser Gly Ala Gly Val
            1300                1305                1310

Trp Gly Ser Ala Gly Gln Gly Ala Tyr Ala Ala Ala Asn Ala Ala Leu
        1315                1320                1325
```

```
Asp Ala Leu Ala Arg Arg Arg Ala Ala Asp Gly Leu Pro Ala Thr Ser
    1330                1335                1340

Ile Ala Trp Gly Val Trp Gly Gly Gly Gly Met Gly Ala Asp Glu Ala
1345                1350                1355                1360

Gly Ala Glu Tyr Leu Gly Arg Arg Gly Met Arg Pro Met Ala Pro Val
                1365                1370                1375

Ser Ala Leu Arg Ala Met Ala Thr Ala Ile Ala Ser Gly Glu Pro Cys
            1380                1385                1390

Pro Thr Val Thr His Thr Asp Trp Glu Arg Phe Gly Glu Gly Phe Thr
        1395                1400                1405

Ala Phe Arg Pro Ser Pro Leu Ile Ala Gly Leu Gly Thr Pro Gly Gly
    1410                1415                1420

Gly Arg Ala Ala Glu Thr Pro Glu Glu Gly Asn Ala Thr Ala Ala Ala
1425                1430                1435                1440

Asp Leu Thr Ala Leu Pro Pro Ala Glu Leu Arg Thr Ala Leu Arg Glu
                1445                1450                1455

Leu Val Arg Ala Arg Thr Ala Ala Ala Leu Gly Leu Asp Asp Pro Ala
            1460                1465                1470

Glu Val Ala Glu Gly Glu Arg Phe Pro Ala Met Gly Phe Asp Ser Leu
        1475                1480                1485

Ala Thr Val Arg Leu Arg Arg Gly Leu Ala Ser Ala Thr Gly Leu Asp
    1490                1495                1500

Leu Pro Pro Asp Leu Leu Phe Asp Arg Asp Thr Pro Ala Ala Leu Ala
1505                1510                1515                1520

Ala His Leu Ala Glu Leu Leu Ala Thr Ala Arg Asp His Gly Pro Gly
                1525                1530                1535

Gly Pro Gly Thr Gly Ala Ala Pro Ala Asp Ala Gly Ser Gly Leu Pro
            1540                1545                1550

Ala Leu Tyr Arg Glu Ala Val Arg Thr Gly Arg Ala Ala Glu Met Ala
        1555                1560                1565

Glu Leu Leu Ala Ala Ala Ser Arg Phe Arg Pro Ala Phe Gly Thr Ala
    1570                1575                1580

Asp Arg Gln Pro Val Ala Leu Val Pro Leu Ala Asp Gly Ala Glu Asp
1585                1590                1595                1600

Thr Gly Leu Pro Leu Leu Val Gly Cys Ala Gly Thr Ala Val Ala Ser
                1605                1610                1615

Gly Pro Val Glu Phe Thr Ala Phe Ala Gly Ala Leu Ala Asp Leu Pro
            1620                1625                1630

Ala Ala Ala Pro Met Ala Ala Leu Pro Gln Pro Gly Phe Leu Pro Gly
        1635                1640                1645
```

```
Glu Arg Val Pro Ala Thr Pro Glu Ala Leu Phe Glu Ala Gln Ala Glu
    1650                1655                1660

Ala Leu Leu Arg Tyr Ala Ala Gly Arg Pro Phe Val Leu Leu Gly His
1665                1670                1675                1680

Ser Ala Gly Ala Asn Met Ala His Ala Leu Thr Arg His Leu Glu Ala
                1685                1690                1695

Asn Gly Gly Gly Pro Ala Gly Leu Val Leu Met Asp Ile Tyr Thr Pro
            1700                1705                1710

Ala Asp Pro Gly Ala Met Gly Val Trp Arg Asn Asp Met Phe Gln Trp
        1715                1720                1725

Val Trp Arg Arg Ser Asp Ile Pro Pro Asp Asp His Arg Leu Thr Ala
    1730                1735                1740

Met Gly Ala Tyr His Arg Leu Leu Leu Asp Trp Ser Pro Thr Pro Val
1745                1750                1755                1760

Arg Ala Pro Val Leu His Leu Arg Ala Ala Glu Pro Met Gly Asp Trp
                1765                1770                1775

Pro Pro Gly Asp Thr Gly Trp Gln Ser His Trp Asp Gly Ala His Thr
            1780                1785                1790

Thr Ala Gly Ile Pro Gly Asn His Phe Thr Met Met Thr Glu His Ala
        1795                1800                1805

Ser Ala Ala Ala Arg Leu Val His Gly Trp Leu Ala Glu Arg Thr Pro
    1810                1815                1820

Ser Gly Gln Gly Gly Ser Pro Ser Arg Ala Ala Gly Arg Glu Glu Arg
1825                1830                1835                1840

Pro  *
```

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 44377 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 350..14002

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 14046..20036

(ix) FEATURE:
(A) NAME/KEY: CDS

(B) LOCATION: 20110..31284

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 31329..36071

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 36155..41830

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

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CCGCGGACCC CGAGGTGGCG GCGGCCGTCC TGGCCGACCC GCGCTTCGGC ACGCTGGACC 42960

GGGCCGGACG CCGCCCGGAC GAGGAACTGC TGCCCCTCGC CGAGGCGTTC CCCCACCACG 43020

AACGCGCGGA GCTCGTACGC CTGCGGGCGC TGGCCGCCCC GGTGCTCAGC CGGTACGCCC 43080

CGGCCCAGGC GCCCTGCGCG GCGCGCACCA CCGCCCGCAG AGTGCTCGGC CGCCTGCTGC 43140

CCACCGGTGA CGCCGGGTTC GACCTTGTCG GCGAGGTCGC CCGGCCCTAC GCCGTCGAGC 43200

TGATGCTCAG GCTCCTCGGA GTGCCGGGCC GCGACCGCGC CACCGCCGCG CGGGCACTCG 43260

CCGCCTGCGG CCCCCAGCTC GACGCCCGGA TGGCCCCGCA ACTGCTGACC GTGGCCCGGG 43320

AGTCCGCCGA CGCCGTCCGC ACACTGGCCG ACCTGGTCCC CGAGCTCGTC GCGGAGAAGT 43380

CCCGGGGCCT CGGGAACGCC GAGCCCCGGC CCGACGACGT GCTCGCCCTC CTCCTGCACG 43440

ACGGCGTCGC CCCCGGCGAC GTCGAGCGCA TCGCGCTGCT CCTCGCGGTC GGCGCACCCG 43500

AACCCGTCGT CACCGCCGTC GCGCACACGG TCCACCGGCT GCTCGGCCGG CCGGGGGAGT 43560

GGGAGAGGGC CCGCCGGACG CCGGCCGCGG CGAACGCCGT CGACCAGGTG CTGCGCGAGC 43620

GCCCCCCGGC CCGGCTGGAG AACCGGGTCG CGCACACCGG CCTCGAACTC GGCGGCCGCC 43680

GGATCACCGC CGACGAGCAC GTCGTGGTGC TGGCCGCCGC CGGACGGGAG ATCCCCGGGC 43740

CGGAGCCGCT CGGGGGCGCC GACGGACCGC ACCTGGCGCT CGCCCTCCCG CTGATCCGCC 43800

TGGCCGCCAC CACCGCGGTC CAGGTCACGG CCGGCCGCCT GCCCGGCCTG CGGGCCGAGG 43860

GACCGCCCCT GACCCGGCCG CGGTCACCGG TCCTGGGCGC CTGCGCCCGC CTCCGGGTCC 43920

ACCCGGGATG ACCCCGCCGT CCGTACGCCC CCTCCCAGAC CGGAGCCGCT GTGCGCGTCC 43980

TGCTGACATC CCTCGCCCAC AACACCCACT ACTACAGTCT GGTGCCCCTC GCCTGGGCGC 44040

TGCGCGCCGC CGGGCACGAG GTACGGGTGG CGAGCCCGCC CTCCCTCACC GACGTCATCA 44100

CCTCCACCGG TCTGACCGCC GTACCGGTGG GCGACGACCG ACCGGCCGCG GAGCTGCTCG 44160

CCGAGATGGG CAGAGACCTC GTCCCCTACC AGAGGGGCTT CGAGTTCGGT GAGGTGGAGA 44220

3GCGAGGAGGA GACCACCTGG GAGTACCTGC TCGGCCAGCA GAGCATGATG GCCGCCCTGT 44280

GCTTCGCCCC GTTCAACGGC GCCGCCACGA TGGACGAGAT CGTCGACTTC GCCCGTGGCT 44340

GGCGGCCCGA CCTGGTCGTG TGGGAACCCT GGACCTA 44377

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 4550 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

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Met Ser Gly Glu Leu Ala Ile Ser Arg Ser Asp Asp Arg Ser Asp Ala
1               5                  10                  15

Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Ala Pro Gly Ile
            20                  25                  30

Ala Glu Phe Trp Lys Leu Leu Thr Asp Gly Arg Asp Ala Ile Gly Arg
        35                  40                  45

Asp Ala Asp Gly Arg Arg Arg Gly Met Ile Glu Ala Pro Gly Asp Phe
    50                  55                  60

Asp Ala Ala Phe Phe Gly Met Ser Pro Arg Glu Ala Ala Glu Thr Asp
65                  70                  75                  80

Pro Gln Gln Arg Leu Met Leu Glu Leu Gly Trp Glu Ala Leu Glu Asp
                85                  90                  95

Ala Gly Ile Val Pro Gly Ser Leu Arg Gly Glu Ala Val Gly Val Phe
            100                 105                 110

Val Gly Ala Met His Asp Asp Tyr Ala Thr Leu Leu His Arg Ala Gly
        115                 120                 125

Ala Pro Val Gly Pro His Thr Ala Thr Gly Leu Gln Arg Ala Met Leu
    130                 135                 140
Ala Asn Arg Leu Ser Tyr Val Leu Gly Thr Arg Gly Pro Ser Leu Ala
145                 150                 155                 160

Val Asp Thr Ala Gln Ser Ser Ser Leu Val Ala Val Ala Leu Ala Val
                165                 170                 175

Glu Ser Leu Arg Ala Gly Thr Ser Arg Val Ala Val Ala Gly Gly Val
            180                 185                 190

Asn Leu Val Leu Ala Asp Glu Gly Thr Ala Ala Met Glu Arg Leu Gly
        195                 200                 205

Ala Leu Ser Pro Asp Gly Arg Cys His Thr Phe Asp Ala Arg Ala Asn
    210                 215                 220

Gly Tyr Val Arg Gly Glu Gly Gly Ala Ala Val Val Leu Lys Pro Leu
225                 230                 235                 240

Ala Asp Ala Leu Ala Asp Gly Asp Pro Val Tyr Cys Val Val Arg Gly
                245                 250                 255

Val Ala Val Gly Asn Asp Gly Gly Gly Pro Gly Leu Thr Ala Pro Asp
            260                 265                 270

Arg Glu Gly Gln Glu Ala Val Leu Arg Ala Ala Cys Ala Gln Ala Arg
        275                 280                 285

Val Asp Pro Ala Glu Val Arg Phe Val Glu Leu His Gly Thr Gly Thr
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    290                 295                 300

Pro Val Gly Asp Pro Val Glu Ala His Ala Leu Gly Ala Val His Gly
305                 310                 315                 320

Ser Gly Arg Pro Ala Asp Asp Pro Leu Leu Val Gly Ser Val Lys Thr
                325                 330                 335

Asn Ile Gly His Leu Glu Gly Ala Ala Gly Ile Ala Gly Leu Val Lys
            340                 345                 350

Ala Ala Leu Cys Leu Arg Glu Arg Thr Leu Pro Gly Ser Leu Asn Phe
        355                 360                 365

Ala Thr Pro Ser Pro Ala Ile Pro Leu Asp Gln Leu Arg Leu Lys Val
    370                 375                 380

Gln Thr Ala Ala Ala Glu Leu Pro Leu Ala Pro Gly Gly Ala Pro Leu
385                 390                 395                 400

Leu Ala Gly Val Ser Ser Phe Gly Ile Gly Gly Thr Asn Cys His Val
                405                 410                 415

Val Leu Glu His Leu Pro Ser Arg Pro Thr Pro Ala Val Ser Val Ala
            420                 425                 430

Ala Ser Leu Pro Asp Val Pro Pro Leu Leu Leu Ser Ala Arg Ser Glu
        435                 440                 445

Gly Ala Leu Arg Ala Gln Ala Val Arg Leu Gly Glu Tyr Val Glu Arg
    450                 455                 460

Val Gly Ala Asp Pro Arg Asp Val Ala Tyr Ser Leu Ala Ser Thr Arg
465                 470                 475                 480

Thr Leu Phe Glu His Arg Ala Val Val Pro Cys Gly Gly Arg Gly Glu
                485                 490                 495
Leu Val Ala Ala Leu Gly Gly Phe Ala Ala Gly Arg Val Ser Gly Gly
            500                 505                 510

Val Arg Ser Gly Arg Ala Val Pro Gly Gly Val Gly Val Leu Phe Thr
        515                 520                 525

Gly Gln Gly Ala Gln Trp Val Gly Met Gly Arg Gly Leu Tyr Ala Gly
    530                 535                 540

Gly Gly Val Phe Ala Glu Val Leu Asp Glu Val Leu Ser Met Val Gly
545                 550                 555                 560

Glu Val Asp Gly Arg Ser Leu Arg Asp Val Met Phe Gly Asp Val Asp
                565                 570                 575

Val Asp Ala Gly Ala Gly Ala Asp Ala Gly Ala Gly Ala Gly Ala Gly
            580                 585                 590

Val Gly Ser Gly Ser Gly Ser Val Gly Gly Leu Leu Gly Arg Thr Glu
        595                 600                 605

Phe Ala Gln Pro Ala Leu Phe Ala Leu Glu Val Ala Leu Phe Arg Ala
    610                 615                 620
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Leu Glu Ala Arg Gly Val Glu Val Ser Val Val Leu Gly His Ser Val
625                 630                 635                 640

Gly Glu Val Ala Ala Ala Tyr Val Ala Gly Val Leu Ser Leu Gly Asp
                645                 650                 655

Ala Val Arg Leu Val Val Ala Arg Gly Gly Leu Met Gly Gly Leu Pro
            660                 665                 670

Val Gly Gly Gly Met Trp Ser Val Gly Ala Ser Glu Ser Val Val Arg
        675                 680                 685

Gly Val Val Glu Gly Leu Gly Glu Trp Val Ser Val Ala Ala Val Asn
    690                 695                 700

Gly Pro Arg Ser Val Val Leu Ser Gly Asp Val Gly Val Leu Glu Ser
705                 710                 715                 720

Val Val Ala Ser Leu Met Gly Asp Gly Val Glu Cys Arg Arg Leu Asp
                725                 730                 735

Val Ser His Gly Phe His Ser Val Leu Met Glu Pro Val Leu Gly Glu
            740                 745                 750

Phe Arg Gly Val Val Glu Ser Leu Glu Phe Gly Arg Val Arg Pro Gly
        755                 760                 765

Val Val Val Val Ser Gly Val Ser Gly Gly Val Val Gly Ser Gly Glu
    770                 775                 780

Leu Gly Asp Pro Gly Tyr Trp Val Arg His Ala Arg Glu Ala Val Arg
785                 790                 795                 800

Phe Ala Asp Gly Val Gly Val Val Arg Gly Leu Gly Val Gly Thr Leu
                805                 810                 815

Val Glu Val Gly Pro His Gly Val Leu Thr Gly Met Ala Gly Glu Cys
            820                 825                 830

Leu Gly Ala Gly Asp Asp Val Val Val Val Pro Ala Met Arg Arg Gly
        835                 840                 845
Arg Ala Glu Arg Glu Val Phe Glu Ala Ala Leu Ala Thr Val Phe Thr
    850                 855                 860

Arg Asp Ala Gly Leu Asp Ala Thr Ala Leu His Thr Gly Ser Thr Gly
865                 870                 875                 880

Arg Arg Ile Asp Leu Pro Thr Tyr Pro Phe Gln Arg Arg Thr His Trp
                885                 890                 895

Ser Pro Ala Leu Ser Arg Pro Val Thr Ala Asp Ala Gly Ala Gly Val
            900                 905                 910

Thr Ala Thr Asp Ala Val Gly His Ser Val Ser Pro Asp Pro Glu Ser
        915                 920                 925

Thr Glu Gly Thr Ser His Arg Asp Thr Asp Asp Glu Ala Asp Ser Ala
    930                 935                 940
```

Ser Pro Glu Pro Met Ser Pro Glu Asp Ala Val Arg Leu Val Arg Glu
945 950 955 960

Ser Thr Ala Ala Val Leu Gly His Asp Asp Pro Gly Glu Val Ala Leu
965 970 975

Asp Arg Thr Phe Thr Ser Gln Gly Met Asp Ser Val Thr Ala Val Glu
980 985 990

Leu Cys Asp Leu Leu Lys Gly Ala Ser Gly Leu Pro Leu Ala Ala Thr
995 1000 1005

Leu Val Tyr Asp Leu Pro Thr Pro Arg Ala Val Ala Glu His Ile Val
1010 1015 1020

Glu Ala Ala Gly Gly Pro Lys Asp Ser Val Ala Gly Gly Pro Gly Val
1025 1030 1035 1040

Leu Ser Ser Ala Ala Val Gly Val Ser Asp Ala Arg Gly Gly Ser Arg
1045 1050 1055

Asp Asp Asp Asp Pro Ile Ala Ile Val Gly Val Gly Cys Arg Leu Pro
1060 1065 1070

Gly Gly Val Asp Ser Arg Ala Ala Leu Trp Glu Leu Leu Glu Ser Gly
1075 1080 1085

Ala Asp Ala Ile Ser Ser Phe Pro Thr Asp Arg Gly Trp Asp Leu Asp
1090 1095 1100

Gly Leu Tyr Asp Pro Glu Pro Gly Thr Pro Gly Lys Thr Tyr Val Arg
1105 1110 1115 1120

Glu Gly Gly Phe Leu His Ser Ala Ala Glu Phe Asp Ala Glu Phe Phe
1125 1130 1135

Gly Ile Ser Pro Arg Glu Ala Thr Ala Met Asp Pro Gln Gln Arg Leu
1140 1145 1150

Leu Leu Glu Ala Ser Trp Glu Ala Leu Glu Asp Ala Gly Val Leu Pro
1155 1160 1165

Glu Ser Leu Arg Gly Gly Asp Ala Gly Val Phe Val Gly Ala Thr Ala
1170 1175 1180

Pro Glu Tyr Gly Pro Arg Leu His Glu Gly Ala Asp Gly Tyr Glu Gly
1185 1190 1195 1200
Tyr Leu Leu Thr Gly Thr Thr Ala Ser Val Ala Ser Gly Arg Ile Ala
1205 1210 1215

Tyr Thr Leu Gly Thr Gly Gly Pro Ala Leu Thr Val Asp Thr Ala Cys
1220 1225 1230

Ser Ser Ser Leu Val Ala Leu His Leu Ala Val Gln Ala Leu Arg Arg
1235 1240 1245

Gly Glu Cys Gly Leu Ala Leu Ala Gly Gly Ala Thr Val Met Ser Gly
1250 1255 1260

Pro Gly Met Phe Val Glu Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp

1265 1270 1275 1280

Gly Arg Cys Met Pro Phe Ser Ala Asp Ala Asp Gly Thr Ala Trp Ser
1285 1290 1295

Glu Gly Val Ala Val Leu Ala Leu Glu Arg Leu Ser Asp Ala Arg Arg
1300 1305 1310

Ala Gly His Arg Val Leu Gly Val Val Arg Gly Ser Ala Val Asn Gln
1315 1320 1325

Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Arg Ser Ala Gln Glu
1330 1335 1340

Gly Val Ile Arg Ala Ala Leu Ala Asp Ala Gly Leu Ala Pro Gly Asp
1345 1350 1355 1360

Val Asp Ala Val Glu Ala His Gly Thr Gly Thr Ala Leu Gly Asp Pro
1365 1370 1375

Ile Glu Ala Ser Ala Leu Leu Ala Thr Tyr Gly Arg Glu Arg Val Gly
1380 1385 1390

Asp Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Val Gly His Thr Gln
1395 1400 1405

Ala Ala Ala Gly Ala Ala Gly Val Val Lys Met Leu Leu Ala Leu Glu
1410 1415 1420

His Gly Thr Leu Pro Arg Thr Leu His Ala Asp Arg Pro Ser Thr His
1425 1430 1435 1440

Val Asp Trp Ser Ser Gly Thr Val Ala Leu Leu Ala Glu Ala Arg Arg
1445 1450 1455

Trp Pro Arg Arg Ser Asp Arg Pro Arg Arg Ala Ala Val Ser Ser Phe
1460 1465 1470

Gly Ile Ser Gly Thr Asn Ala His Leu Ile Ile Glu Glu Ala Pro Glu
1475 1480 1485

Trp Val Glu Asp Ile Asp Gly Val Ala Ala Pro Asp Arg Gly Thr Ala
1490 1495 1500

Asp Ala Ala Ala Pro Ser Pro Leu Leu Leu Ser Ala Arg Ser Glu Gly
1505 1510 1515 1520

Ala Leu Arg Ala Gln Ala Val Arg Leu Gly Glu Tyr Val Glu Arg Val
1525 1530 1535

Gly Ala Asp Pro Arg Asp Val Ala Tyr Ser Leu Ala Ser Thr Arg Thr
1540 1545 1550

Leu Phe Glu His Arg Ala Val Val Pro Cys Gly Gly Arg Gly Glu Leu
1555 1560 1565

Val Ala Ala Leu Gly Gly Phe Ala Ala Gly Arg Val Ser Gly Gly Val
1570 1575 1580

Arg Ser Gly Arg Ala Val Pro Gly Gly Val Gly Val Leu Phe Thr Gly
1585 1590 1595 1600

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Gln Gly Ala Gln Trp Val Gly Met Gly Arg Gly Leu Tyr Ala Gly Gly
                1605                1610                1615

Gly Val Phe Ala Glu Val Leu Asp Glu Val Leu Ser Met Val Gly Glu
            1620                1625                1630

Val Asp Gly Arg Ser Leu Arg Asp Val Met Phe Gly Asp Val Asp Val
        1635                1640                1645

Asp Ala Gly Ala Gly Ala Asp Ala Gly Ala Gly Ala Gly Ala Gly Val
    1650                1655                1660

Gly Ser Gly Ser Gly Ser Val Gly Gly Leu Leu Gly Arg Thr Glu Phe
1665                1670                1675                1680

Ala Gln Pro Ala Leu Phe Ala Leu Glu Val Ala Leu Phe Arg Ala Leu
                1685                1690                1695

Glu Ala Arg Gly Val Glu Val Ser Val Val Leu Gly His Ser Val Gly
            1700                1705                1710

Glu Val Ala Ala Ala Tyr Val Ala Gly Val Leu Ser Leu Gly Asp Ala
        1715                1720                1725

Val Arg Leu Val Val Ala Arg Gly Gly Leu Met Gly Gly Leu Pro Val
    1730                1735                1740

Gly Gly Gly Met Trp Ser Val Gly Ala Ser Glu Ser Val Val Arg Gly
1745                1750                1755                1760

Val Val Glu Gly Leu Gly Glu Trp Val Ser Val Ala Ala Val Asn Gly
                1765                1770                1775

Pro Arg Ser Val Val Leu Ser Gly Asp Val Gly Val Leu Glu Ser Val
            1780                1785                1790

Val Ala Ser Leu Met Gly Asp Gly Val Glu Cys Arg Arg Leu Asp Val
        1795                1800                1805

Ser His Gly Phe His Ser Val Leu Met Glu Pro Val Leu Gly Glu Phe
    1810                1815                1820

Arg Gly Val Val Glu Ser Leu Glu Phe Gly Arg Val Arg Pro Gly Val
1825                1830                1835                1840

Val Val Val Ser Gly Val Ser Gly Gly Val Val Gly Ser Gly Glu Leu
                1845                1850                1855

Gly Asp Pro Gly Tyr Trp Val Arg His Ala Arg Glu Ala Val Arg Phe
            1860                1865                1870

Ala Asp Gly Val Gly Val Val Arg Gly Leu Gly Val Gly Thr Leu Val
        1875                1880                1885

Glu Val Gly Pro His Gly Val Leu Thr Gly Met Ala Gly Glu Cys Leu
    1890                1895                1900
Gly Ala Gly Asp Asp Val Val Val Val Pro Ala Met Arg Arg Gly Arg
1905                1910                1915                1920
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Ala Glu Arg Glu Val Phe Glu Ala Ala Leu Ala Thr Val Phe Thr Arg
                1925                1930                1935

Asp Ala Gly Leu Asp Ala Thr Ala Leu His Thr Gly Ser Thr Gly Arg
            1940                1945                1950

Arg Ile Asp Leu Pro Thr Tyr Pro Phe Gln Arg Asp Arg Tyr Trp Leu
        1955                1960                1965

Asp Pro Val Arg Thr Ala Val Thr Gly Val Glu Pro Ala Gly Ser Pro
    1970                1975                1980

Ala Asp Ala Arg Ala Thr Glu Arg Gly Arg Ser Thr Thr Ala Gly Ile
1985                1990                1995                2000

Arg Tyr Arg Val Ala Trp Gln Pro Ala Val Val Asp Arg Gly Asn Pro
                2005                2010                2015

Gly Pro Ala Gly His Val Leu Leu Leu Ala Pro Asp Glu Asp Thr Ala
            2020                2025                2030

Asp Ser Gly Leu Ala Pro Ala Ile Ala Arg Glu Leu Ala Val Arg Gly
        2035                2040                2045

Ala Glu Val His Thr Val Ala Val Pro Val Gly Thr Gly Arg Glu Ala
    2050                2055                2060

Ala Gly Asp Leu Leu Arg Ala Ala Gly Asp Gly Ala Ala Arg Ser Thr
2065                2070                2075                2080

Arg Val Leu Trp Leu Ala Pro Ala Glu Pro Asp Ala Ala Asp Ala Val
                2085                2090                2095

Ala Leu Val Gln Ala Leu Gly Glu Ala Val Pro Glu Ala Pro Leu Trp
            2100                2105                2110

Ile Thr Thr Arg Glu Ala Ala Ala Val Arg Pro Asp Glu Thr Pro Ser
        2115                2120                2125

Val Gly Gly Ala Gln Leu Trp Gly Leu Gly Gln Val Ala Ala Leu Glu
    2130                2135                2140

Leu Gly Arg Arg Trp Gly Gly Leu Ala Asp Leu Pro Gly Ser Ala Ser
2145                2150                2155                2160

Pro Ala Val Leu Arg Thr Phe Val Gly Ala Leu Leu Ala Gly Gly Glu
                2165                2170                2175

Asn Gln Phe Ala Val Arg Pro Ser Gly Val His Val Arg Arg Val Val
            2180                2185                2190

Pro Ala Pro Val Pro Val Pro Ala Ser Ala Arg Thr Val Thr Thr Ala
        2195                2200                2205

Pro Ala Thr Ala Val Gly Glu Asp Ala Arg Asn Asp Thr Ser Asp Val
    2210                2215                2220

Val Val Pro Asp Asp Arg Trp Ser Ser Gly Thr Val Leu Ile Thr Gly
2225                2230                2235                2240
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Gly Thr Gly Ala Leu Gly Ala Gln Val Ala Arg Arg Leu Ala Arg Ser
2245 2250 2255
Gly Ala Ala Arg Leu Leu Leu Val Gly Arg Arg Gly Ala Ala Gly Pro
2260 2265 2270

Gly Val Gly Glu Leu Val Glu Glu Leu Thr Ala Leu Gly Ser Glu Val
2275 2280 2285

Ala Val Glu Ala Cys Asp Val Ala Asp Arg Asp Ala Leu Ala Ala Leu
2290 2295 2300

Leu Ala Gly Leu Pro Glu Glu Arg Pro Leu Val Ala Val Leu His Ala
2305 2310 2315 2320

Ala Gly Val Leu Asp Asp Gly Val Leu Asp Ser Leu Thr Ser Asp Arg
2325 2330 2335

Val Asp Ala Val Leu Arg Asp Lys Val Thr Ala Ala Arg His Leu Asp
2340 2345 2350

Glu Leu Thr Ala Asp Leu Pro Leu Asp Ala Phe Val Leu Phe Ser Ser
2355 2360 2365

Ile Val Gly Val Trp Gly Asn Gly Gly Gln Ala Val Tyr Ala Ala Ala
2370 2375 2380

Asn Ala Ala Leu Asp Ala Leu Ala Gln Arg Arg Arg Ala Arg Gly Ala
2385 2390 2395 2400

Arg Ala Ala Ser Ile Ala Trp Gly Pro Trp Ala Gly Ala Gly Met Ala
2405 2410 2415

Ser Gly Thr Ala Ala Lys Ser Phe Glu Arg Asp Gly Val Thr Ala Leu
2420 2425 2430

Asp Pro Glu Arg Ala Leu Asp Val Leu Asp Asp Val Val Gly Ala Gly
2435 2440 2445

Gly Thr Ser Ala Ala Gly Thr His Ala Ala Gly Glu Ser Ser Leu Leu
2450 2455 2460

Val Ala Asp Val Asp Trp Glu Thr Phe Val Gly Arg Ser Val Thr Arg
2465 2470 2475 2480

Arg Thr Trp Ser Leu Phe Asp Gly Val Ser Ala Ala Arg Ser Ala Arg
2485 2490 2495

Ala Gly His Ala Ala Asp Asp Arg Ala Ala Leu Thr Pro Gly Thr Arg
2500 2505 2510

Pro Gly Asp Gly Ala Pro Gly Gly Ser Gly Gln Asp Gly Gly Glu Gly
2515 2520 2525

Arg Pro Trp Leu Ser Val Gly Pro Ser Pro Ala Glu Arg Arg Arg Ala
2530 2535 2540

Leu Leu Thr Leu Val Arg Ser Glu Ala Ala Gly Ile Leu Arg His Ala
2545 2550 2555 2560

Ser Ala Asp Ala Val Asp Pro Glu Leu Ala Phe Arg Ser Ala Gly Phe

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                2565                2570                2575

Asp Ser Leu Thr Val Leu Glu Leu Arg Asn Arg Leu Thr Ala Ala Thr
            2580                2585                2590

Gly Leu Asn Leu Pro Asn Thr Leu Leu Phe Asp His Pro Thr Pro Leu
        2595                2600                2605
Ser Leu Ala Ser His Leu His Asp Glu Leu Phe Gly Pro Asp Ser Glu
    2610                2615                2620

Ala Glu Pro Ala Ala Ala Ala Pro Thr Pro Val Met Ala Asp Glu Arg
2625                2630                2635                2640

Glu Pro Ile Ala Ile Val Gly Met Ala Cys Arg Tyr Pro Gly Gly Val
                2645                2650                2655

Ala Ser Pro Asp Asp Leu Trp Asp Leu Val Ala Gly Asp Gly His Thr
            2660                2665                2670

Leu Ser Pro Phe Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Leu Tyr
        2675                2680                2685

Asp Pro Glu Pro Gly Val Pro Gly Lys Ser Tyr Val Arg Glu Gly Gly
    2690                2695                2700

Phe Leu Arg Ser Ala Ala Glu Phe Asp Ala Glu Phe Phe Gly Ile Ser
2705                2710                2715                2720

Pro Arg Glu Ala Thr Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu
                2725                2730                2735

Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly Ile Val Pro Asp Ser Leu
            2740                2745                2750

Arg Gly Thr Arg Thr Gly Val Phe Ser Gly Ile Ser Gln Gln Asp Tyr
        2755                2760                2765

Ala Thr Gln Leu Gly Asp Ala Ala Asp Thr Tyr Gly Gly His Val Leu
    2770                2775                2780

Thr Gly Thr Leu Gly Ser Val Ile Ser Gly Arg Val Ala Tyr Ala Leu
2785                2790                2795                2800

Gly Leu Glu Gly Pro Ala Leu Thr Val Asp Thr Ala Cys Ser Ser Ser
                2805                2810                2815

Leu Val Ala Leu His Leu Ala Val Gln Ser Leu Arg Arg Gly Glu Cys
            2820                2825                2830

Asp Leu Ala Leu Ala Gly Gly Val Thr Val Met Ala Thr Pro Thr Val
        2835                2840                2845

Phe Val Glu Phe Ser Arg Gln Arg Gly Leu Ala Ala Asp Gly Arg Cys
    2850                2855                2860

Lys Ala Phe Ala Glu Gly Ala Asp Gly Thr Ala Trp Ala Glu Gly Val
2865                2870                2875                2880

Gly Val Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly His.
                2885                2890                2895
```

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Arg Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp Gly Ala
            2900                2905                2910

Ser Asn Gly Leu Thr Ala Pro Ser Gly Pro Ala Gln Gln Arg Val Ile
        2915                2920                2925

Arg Glu Ala Leu Ala Asp Ala Gly Leu Val Pro Ala Asp Val Asp Val
    2930                2935                2940

Val Glu Ala His Gly Thr Gly Thr Ala Leu Gly Asp Pro Ile Glu Ala
2945                2950                2955                2960
Gly Ala Leu Leu Ala Thr Tyr Gly Arg Glu Arg Val Gly Asp Pro Leu
                2965                2970                2975

Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Ala Gln Ala Ala Ala
            2980                2985                2990

Gly Val Gly Gly Val Ile Lys Val Val Gln Gly Met Arg His Gly Ser
        2995                3000                3005

Leu Pro Arg Thr Leu His Val Asp Ala Pro Ser Ser Lys Val Glu Trp
    3010                3015                3020

Ala Ser Gly Ala Val Glu Leu Leu Thr Glu Thr Arg Ser Trp Pro Arg
3025                3030                3035                3040

Arg Val Glu Arg Val Arg Arg Ala Ala Val Ser Ala Phe Gly Val Ser
                3045                3050                3055

Gly Thr Asn Ala His Val Val Leu Glu Glu Ala Pro Ala Glu Ala Gly
            3060                3065                3070

Ser Glu His Gly Asp Gly Pro Glu Pro Glu Arg Pro Asp Ala Val Thr
        3075                3080                3085

Gly Pro Leu Ser Trp Val Leu Ser Ala Arg Ser Glu Gly Ala Leu Arg
    3090                3095                3100

Ala Gln Ala Val Arg Leu Arg Glu Cys Val Glu Arg Val Gly Ala Asp
3105                3110                3115                3120

Pro Arg Asp Val Ala Gly Ser Leu Val Val Ser Arg Ala Ser Phe Gly
                3125                3130                3135

Glu Arg Ala Val Val Val Gly Arg Gly Arg Glu Glu Leu Leu Ala Gly
            3140                3145                3150

Leu Asp Val Val Ala Ala Gly Ala Pro Val Gly Val Ser Ser Gly Ala
        3155                3160                3165

Gly Ala Val Val Arg Gly Ser Ala Val Arg Gly Arg Gly Val Gly Val
    3170                3175                3180

Leu Phe Thr Gly Gln Gly Ala Gln Trp Val Gly Met Gly Arg Gly Leu
3185                3190                3195                3200

Tyr Ala Gly Gly Gly Val Phe Ala Glu Val Leu Asp Glu Val Leu Ser
                3205                3210                3215
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Val Val Gly Glu Val Asp Gly Arg Ser Leu Arg Asp Val Met Phe Ala
3220 3225 3230

Asp Ala Asp Ser Val Leu Gly Gly Leu Leu Gly Arg Thr Glu Phe Ala
3235 3240 3245

Gln Pro Ala Leu Phe Ala Leu Glu Val Ala Leu Phe Arg Ala Leu Glu
3250 3255 3260

Ala Arg Gly Val Glu Val Ser Val Val Leu Gly His Ser Val Gly Glu
3265 3270 3275 3280

Val Ala Ala Ala Tyr Val Ala Gly Val Leu Ser Leu Gly Asp Ala Val
3285 3290 3295

Arg Leu Val Val Ala Arg Gly Gly Leu Met Gly Gly Leu Pro Val Gly
3300 3305 3310

Gly Gly Met Trp Ser Val Gly Ala Ser Glu Ser Val Val Arg Gly Val
3315 3320 3325

Val Glu Gly Leu Gly Glu Trp Val Ser Val Ala Ala Val Asn Gly Pro
3330 3335 3340

Arg Ser Val Val Leu Ser Gly Asp Val Gly Val Leu Glu Ser Val Val
3345 3350 3355 3360

Val Thr Leu Met Gly Asp Gly Val Glu Cys Arg Arg Leu Asp Val Ser
3365 3370 3375

His Gly Phe His Ser Val Leu Met Glu Pro Val Leu Gly Glu Phe Arg
3380 3385 3390

Gly Val Val Glu Ser Leu Glu Phe Gly Arg Val Arg Pro Gly Val Val
3395 3400 3405

Val Val Ser Gly Val Ser Gly Gly Val Val Gly Ser Gly Glu Leu Gly
3410 3415 3420

Asp Pro Gly Tyr Trp Val Arg His Ala Arg Glu Ala Val Arg Phe Ala
3425 3430 3435 3440

Asp Gly Val Gly Val Val Arg Gly Leu Gly Val Gly Thr Leu Val Glu
3445 3450 3455

Val Gly Pro His Gly Val Leu Thr Gly Met Ala Gly Gln Cys Leu Glu
3460 3465 3470

Ala Gly Asp Asp Val Val Val Val Pro Ala Met Arg Arg Gly Arg Pro
3475 3480 3485

Glu Arg Glu Val Phe Glu Ala Ala Leu Ala Thr Val Phe Thr Arg Asp
3490 3495 3500

Ala Gly Leu Asp Ala Thr Thr Leu His Thr Gly Ser Thr Gly Arg Arg
3505 3510 3515 3520

Ile Asp Leu Pro Thr Tyr Pro Phe Gln His Asn Arg Tyr Trp Ala Thr
3525 3530 3535

Gly Ser Val Thr Gly Ala Thr Gly Thr Ser Ala Ala Ala Arg Phe Gly

3540 3545 3550

Leu Glu Trp Lys Asp His Pro Phe Leu Ser Gly Ala Thr Pro Ile Ala
3555 3560 3565

Gly Ser Gly Ala Leu Leu Leu Thr Gly Arg Val Gly Leu Ala Ala His
3570 3575 3580

Pro Trp Leu Ala Asp His Ala Ile Ser Gly Thr Val Leu Leu Pro Gly
3585 3590 3595 3600

Thr Ala Ile Ala Asp Leu Leu Leu Arg Ala Val Glu Glu Val Gly Ala
3605 3610 3615

Gly Gly Val Glu Glu Leu Thr Leu His Glu Pro Leu Leu Leu Pro Glu
3620 3625 3630

Arg Gly Gly Leu His Val Gln Val Leu Val Glu Ala Ala Asp Glu Gln
3635 3640 3645

Gly Arg Arg Ala Val Ala Val Ala Ala Arg Pro Glu Gly Pro Gly Arg
3650 3655 3660

Asp Gly Glu Glu Gln Glu Trp Thr Arg His Ala Glu Gly Val Leu Thr
3665 3670 3675 3680

Ser Thr Glu Thr Ala Val Pro Asp Met Gly Trp Ala Ala Gly Ala Trp
3685 3690 3695

Pro Pro Pro Gly Ala Glu Pro Ile Asp Val Glu Glu Leu Tyr Asp Ala
3700 3705 3710

Phe Ala Ala Asp Gly Tyr Gly Tyr Gly Pro Ala Phe Thr Ala Leu Ser
3715 3720 3725

Gly Val Trp Arg Leu Gly Asp Glu Leu Phe Ala Glu Val Arg Arg Pro
3730 3735 3740

Ala Gly Gly Ala Gly Thr Thr Gly Asp Gly Phe Gly Val His Pro Ala
3745 3750 3755 3760

Leu Phe Asp Ala Ala Leu His Pro Trp Arg Ala Gly Gly Leu Leu Pro
3765 3770 3775

Asp Thr Gly Gly Thr Thr Trp Ala Pro Phe Ser Trp Gln Gly Ile Ala
3780 3785 3790

Leu His Thr Thr Gly Ala Glu Thr Leu Arg Val Arg Leu Ala Pro Ala
3795 3800 3805

Ala Gly Gly Thr Glu Ser Ala Phe Ser Val Gln Ala Ala Asp Pro Ala
3810 3815 3820

Gly Thr Pro Val Leu Thr Leu Asp Ala Leu Leu Leu Arg Pro Val Thr
3825 3830 3835 3840

Leu Gly Arg Ala Asp Ala Pro Gln Pro Leu Tyr Arg Val Asp Trp Gln
3845 3850 3855

Pro Val Gly Gln Gly Thr Glu Ala Ser Gly Ala Gln Gly Trp Thr Val
3860 3865 3870

```
Leu Gly Gln Ala Ala Ala Glu Thr Val Ala Gln Pro Ala Ala His Ala
        3875                3880                3885

Asp Leu Thr Ala Leu Arg Thr Ala Val Ala Ala Ala Gly Thr Pro Val
    3890                3895                3900

Pro Arg Leu Val Val Val Ser Pro Val Asp Thr Arg Leu Asp Glu Gly
3905                3910                3915                3920

Pro Val Leu Ala Asp Ala Glu Ala Arg Ala Arg Ala Gly Asp Gly Trp
                3925                3930                3935

Asp Asp Asp Pro Leu Arg Val Ala Leu Gly Arg Gly Leu Thr Leu Val
            3940                3945                3950

Arg Glu Trp Val Glu Asp Glu Arg Leu Ala Asp Ser Arg Leu Val Val
        3955                3960                3965

Leu Thr Arg Gly Ala Val Ala Ala Gly Pro Gly Asp Val Pro Asp Leu
    3970                3975                3980

Thr Gly Ala Ala Leu Trp Gly Leu Leu Arg Ser Ala Gln Ser Glu Tyr
3985                3990                3995                4000

Pro Asp Arg Phe Thr Leu Ile Asp Val Asp Asp Ser Pro Glu Ser Arg
                4005                4010                4015
Ala Ala Leu Pro Arg Ala Leu Gly Ser Ala Glu Arg Gln Leu Ala Leu
            4020                4025                4030

Arg Thr Gly Asp Val Leu Ala Pro Ala Leu Val Pro Met Ala Thr Arg
        4035                4040                4045

Pro Ala Glu Thr Thr Pro Ala Thr Ala Val Ala Ser Ala Thr Thr Gln
    4050                4055                4060

Thr Gln Val Thr Ala Pro Ala Pro Asp Asp Pro Ala Ala Asp Ala Val
4065                4070                4075                4080

Phe Asp Pro Ala Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Ala Leu
                4085                4090                4095

Gly Arg Arg Val Ala Ser His Leu Ala Arg Arg Tyr Gly Val Arg His
            4100                4105                4110

Met Leu Leu Val Ser Arg Arg Gly Pro Asp Ala Pro Glu Ala Gly Pro
        4115                4120                4125

Leu Glu Arg Glu Leu Ala Gly Leu Gly Val Thr Ala Thr Phe Leu Ala
    4130                4135                4140

Cys Asp Leu Thr Asp Ile Glu Ala Val Arg Lys Ala Val Ala Ala Val
4145                4150                4155                4160

Pro Ser Asp His Pro Leu Thr Gly Val Val His Thr Ala Gly Val Leu
                4165                4170                4175

Asp Asp Gly Ala Leu Thr Gly Leu Thr Arg Gln Arg Leu Asp Thr Val
            4180                4185                4190
```

Leu Arg Pro Lys Ala Asp Ala Val Arg Asn Leu His Glu Ala Thr Leu
4195 4200 4205

Asp Arg Pro Leu Arg Ala Phe Val Leu Phe Ser Ala Ala Ala Gly Leu
4210 4215 4220

Leu Gly Arg Pro Gly Gln Ala Ser Tyr Ala Ala Ala Asn Ala Val Leu
4225 4230 4235 4240

Asp Ala Leu Ala Gly Ala Arg Arg Ala Ala Gly Leu Pro Ala Val Ser
4245 4250 4255

Leu Ala Trp Gly Leu Trp Asp Glu Gln Thr Gly Met Ala Gly Gly Leu
4260 4265 4270

Asp Glu Met Ala Leu Arg Val Leu Arg Arg Asp Gly Ile Ala Ala Met
4275 4280 4285

Pro Pro Glu Gln Gly Leu Glu Leu Leu Asp Leu Ala Leu Thr Gly His
4290 4295 4300

Arg Asp Gly Pro Ala Val Leu Val Pro Leu Leu Leu Asp Gly Ala Ala
4305 4310 4315 4320

Leu Arg Arg Thr Ala Lys Glu Arg Gly Ala Ala Thr Met Ser Pro Leu
4325 4330 4335

Leu Arg Ala Leu Leu Pro Ala Ala Leu Arg Arg Ser Gly Gly Ala Gly
4340 4345 4350

Ala Pro Ala Ala Ala Asp Arg His Gly Lys Glu Ala Asp Pro Gly Ala
4355 4360 4365
Gly Arg Leu Ala Gly Met Val Ala Leu Glu Ala Ala Glu Arg Ser Ala
4370 4375 4380

Ala Val Leu Glu Leu Val Thr Glu Gln Val Ala Glu Val Leu Gly Tyr
4385 4390 4395 4400

Ala Ser Ala Ala Glu Ile Glu Pro Glu Arg Pro Phe Arg Glu Ile Gly
4405 4410 4415

Val Asp Ser Leu Ala Ala Val Glu Leu Arg Asn Arg Leu Ser Arg Leu
4420 4425 4430

Val Gly Leu Arg Leu Pro Thr Thr Leu Ser Phe Asp His Pro Thr Pro
4435 4440 4445

Lys Asp Met Ala Gln His Ile Asp Gly Gln Leu Pro Arg Pro Ala Gly
4450 4455 4460

Ala Ser Pro Ala Asp Ala Ala Leu Glu Gly Ile Gly Asp Leu Ala Arg
4465 4470 4475 4480

Ala Val Ala Leu Leu Gly Thr Gly Asp Ala Arg Arg Ala Glu Val Arg
4485 4490 4495

Glu Gln Leu Val Gly Leu Leu Ala Ala Leu Asp Pro Pro Gly Arg Thr
4500 4505 4510

Gly Thr Ala Ala Pro Gly Val Pro Ser Gly Ala Asp Gly Ala Glu Pro

```
        4515                4520                4525

Thr Val Thr Asp Arg Leu Asp Glu Ala Thr Asp Asp Glu Ile Phe Ala
    4530                4535                4540

Phe Leu Asp Glu Gln Leu
4545                4550
```

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1996 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

```
Met Thr Ala Glu Asn Asp Lys Ile Arg Ser Tyr Leu Lys Arg Ala Thr
1               5                  10                  15

Ala Glu Leu His Arg Thr Lys Ser Arg Leu Ala Glu Val Glu Ser Ala
            20                  25                  30

Ser Arg Glu Pro Ile Ala Ile Val Gly Met Ala Cys Arg Tyr Pro Gly
        35                  40                  45

Gly Val Ala Ser Pro Asp Asp Leu Trp Asp Leu Val Ala Ala Gly Thr
    50                  55                  60

Asp Ala Val Ser Ala Phe Pro Val Asp Arg Gly Trp Asp Val Glu Gly
65                  70                  75                  80
Leu Tyr Asp Pro Asp Pro Glu Ala Val Gly Arg Ser Tyr Val Arg Glu
                85                  90                  95

Gly Gly Phe Leu His Ser Ala Ala Glu Phe Asp Ala Glu Phe Phe Gly
            100                 105                 110

Ile Ser Pro Arg Glu Ala Ala Ala Met Asp Pro Gln Gln Arg Leu Leu
        115                 120                 125

Leu Glu Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly Ile Val Pro Ala
    130                 135                 140

Ser Leu Arg Gly Thr Arg Thr Gly Val Phe Thr Gly Val Met Tyr Asp
145                 150                 155                 160

Asp Tyr Gly Ser Arg Phe Asp Ser Ala Pro Pro Glu Tyr Glu Gly Tyr
                165                 170                 175

Leu Val Asn Gly Ser Ala Gly Ser Ile Ala Ser Gly Arg Val Ala Tyr
            180                 185                 190

Ala Leu Gly Leu Glu Gly Pro Ala Leu Thr Val Asp Thr Ala Cys Ser
        195                 200                 205

Ser Ser Leu Val Ala Leu His Leu Ala Val Gln Ser Leu Arg Arg Gly
```

```
    210                 215                 220

Glu Cys Asp Leu Ala Leu Ala Gly Gly Val Thr Val Met Ala Thr Pro
225                 230                 235                 240

Thr Val Leu Val Glu Phe Ser Arg Gln Arg Gly Leu Ala Ala Asp Gly
                245                 250                 255

Arg Cys Lys Ala Phe Ala Glu Gly Ala Asp Gly Thr Ala Trp Ala Glu
            260                 265                 270

Gly Val Gly Val Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn
        275                 280                 285

Gly His Arg Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp
    290                 295                 300

Gly Ala Ser Asn Gly Leu Thr Ala Pro Ser Gly Pro Ala Gln Gln Arg
305                 310                 315                 320

Val Ile Arg Glu Ala Leu Ala Asp Ala Gly Leu Thr Pro Ala Asp Val
                325                 330                 335

Asp Ala Val Glu Ala His Gly Thr Gly Thr Pro Leu Gly Asp Pro Ile
            340                 345                 350

Glu Ala Gly Ala Leu Leu Ala Thr Tyr Gly Ser Glu Arg Gln Gly Gln
        355                 360                 365

Gly Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Ala Gln
    370                 375                 380

Ala Ala Ala Gly Val Gly Gly Val Ile Lys Val Val Gln Ala Met Arg
385                 390                 395                 400

His Gly Ser Leu Pro Arg Thr Leu His Val Asp Ala Pro Ser Ser Lys
                405                 410                 415

Val Glu Trp Ala Ser Gly Ala Val Glu Leu Leu Thr Glu Thr Arg Ser
            420                 425                 430
Trp Pro Arg Arg Val Glu Arg Val Arg Arg Ala Ala Val Ser Ala Phe
        435                 440                 445

Gly Val Ser Gly Thr Asn Ala His Val Val Leu Glu Glu Ala Pro Ala
    450                 455                 460

Glu Ala Gly Ser Glu His Gly Asp Gly Pro Glu Pro Glu Arg Pro Asp
465                 470                 475                 480

Ala Val Thr Gly Pro Leu Ser Trp Val Leu Ser Ala Arg Ser Glu Gly
                485                 490                 495

Ala Leu Arg Ala Gln Ala Val Arg Leu Arg Glu Cys Val Glu Arg Val
            500                 505                 510

Gly Ala Asp Pro Arg Asp Val Ala Gly Ser Leu Val Val Ser Arg Ala
        515                 520                 525

Ser Phe Gly Glu Arg Ala Val Val Val Gly Arg Gly Arg Glu Glu Leu
    530                 535                 540
```

```
Leu Ala Gly Leu Asp Val Val Ala Ala Gly Ala Pro Val Gly Val Ser
545                 550                 555                 560

Gly Gly Val Ser Ser Gly Ala Gly Ala Val Val Arg Gly Ser Ala Val
                565                 570                 575

Arg Gly Arg Gly Val Gly Val Leu Phe Thr Gly Gln Gly Ala Gln Trp
            580                 585                 590

Val Gly Met Gly Arg Gly Leu Tyr Ala Gly Gly Gly Val Phe Ala Glu
        595                 600                 605

Val Leu Asp Glu Val Leu Ser Val Val Gly Glu Val Gly Gly Trp Ser
    610                 615                 620

Leu Arg Asp Val Met Phe Gly Asp Val Asp Val Asp Ala Gly Ala Gly
625                 630                 635                 640

Ala Asp Ala Gly Val Gly Ser Gly Val Gly Val Gly Gly Leu Leu Gly
                645                 650                 655

Arg Thr Glu Phe Ala Gln Pro Ala Leu Phe Ala Leu Glu Val Ala Leu
            660                 665                 670

Phe Arg Ala Leu Glu Ala Arg Gly Val Glu Val Ser Val Val Leu Gly
        675                 680                 685

His Ser Val Gly Glu Val Ala Ala Ala Tyr Val Ala Gly Val Leu Ser
    690                 695                 700

Leu Gly Asp Ala Val Arg Leu Val Val Ala Arg Gly Gly Leu Met Gly
705                 710                 715                 720

Gly Leu Pro Val Gly Gly Gly Met Trp Ser Val Gly Ala Ser Glu Ser
                725                 730                 735

Val Val Arg Gly Val Val Glu Gly Leu Gly Glu Trp Val Ser Val Ala
            740                 745                 750

Ala Val Asn Gly Pro Arg Ser Val Val Leu Ser Gly Asp Val Gly Val
        755                 760                 765

Leu Glu Ser Val Val Ala Ser Leu Met Gly Asp Gly Val Glu Cys Arg
    770                 775                 780
Arg Leu Asp Val Ser His Gly Phe His Ser Val Leu Met Glu Pro Val
785                 790                 795                 800

Leu Gly Glu Phe Arg Gly Val Val Glu Ser Leu Glu Phe Gly Arg Val
                805                 810                 815

Arg Pro Gly Val Val Val Val Ser Ser Val Ser Gly Gly Val Val Gly
            820                 825                 830

Ser Gly Glu Leu Gly Asp Pro Gly Tyr Trp Val Arg His Ala Arg Glu
        835                 840                 845

Ala Val Arg Phe Ala Asp Gly Val Gly Val Val Arg Gly Leu Gly Val
    850                 855                 860
```

Gly Thr Leu Val Glu Val Gly Pro His Gly Val Leu Thr Gly Met Ala
865 870 875 880

Gly Glu Cys Leu Gly Ala Gly Asp Asp Val Val Val Val Pro Ala Met
885 890 895

Arg Arg Gly Arg Ala Glu Arg Glu Val Phe Glu Ala Ala Leu Ala Thr
900 905 910

Val Phe Thr Arg Asp Ala Gly Leu Asp Ala Thr Thr Leu His Thr Gly
915 920 925

Ser Thr Gly Arg Arg Ile Asp Leu Pro Thr Tyr Pro Phe Gln His Asp
930 935 940

Arg Tyr Trp Leu Ala Ala Pro Ser Arg Pro Arg Thr Asp Gly Leu Ser
945 950 955 960

Ala Ala Gly Leu Arg Glu Val Glu His Pro Leu Leu Thr Ala Ala Val
965 970 975

Glu Leu Pro Gly Thr Asp Thr Glu Val Trp Thr Gly Arg Ile Ser Ala
980 985 990

Ala Asp Leu Pro Trp Leu Ala Asp His Leu Val Trp Asp Arg Gly Val
995 1000 1005

Val Pro Gly Thr Ala Leu Leu Glu Thr Val Leu Gln Val Gly Ser Arg
1010 1015 1020

Ile Gly Leu Pro Arg Val Ala Glu Leu Val Leu Glu Thr Pro Leu Thr
1025 1030 1035 1040

Trp Thr Ser Asp Arg Pro Leu Gln Val Arg Ile Val Val Thr Ala Ala
1045 1050 1055

Ala Thr Ala Pro Gly Gly Ala Arg Glu Leu Thr Leu His Ser Arg Pro
1060 1065 1070

Glu Pro Val Ala Ala Ser Ser Ser Ser Pro Ser Pro Ala Ser Pro Arg
1075 1080 1085

His Leu Thr Ala Gln Glu Ser Asp Asp Asp Trp Thr Arg His Ala Ser
1090 1095 1100

Gly Leu Leu Ala Pro Ala Ala Gly Leu Ala Asp Asp Phe Ala Glu Leu
1105 1110 1115 1120

Thr Gly Ala Trp Pro Pro Val Gly Ala Glu Pro Leu Asp Leu Ala Gly
1125 1130 1135
Gln Tyr Pro Leu Phe Ala Ala Ala Gly Val Arg Tyr Glu Gly Ala Phe
1140 1145 1150

Arg Gly Leu Arg Ala Ala Trp Arg Arg Gly Asp Glu Val Phe Ala Asp
1155 1160 1165

Val Arg Leu Pro Asp Ala His Ala Val Asp Ala Asp Arg Tyr Gly Val
1170 1175 1180

His Pro Ala Leu Leu Asp Ala Val Leu His Pro Ile Ala Ser Leu Asp

1185 1190 1195 1200

Pro Leu Gly Asp Gly Gly His Gly Leu Leu Pro Phe Ser Trp Thr Asp
1205 1210 1215

Val Gln Gly His Gly Ala Gly Gly His Ala Leu Arg Val Arg Val Ala
1220 1225 1230

Ala Val Asp Gly Gly Ala Val Ser Val Thr Ala Ala Asp His Ala Gly
1235 1240 1245

Asn Pro Val Leu Ser Ala Arg Ser Leu Ala Leu Arg Arg Ile Thr Ala
1250 1255 1260

Asp Arg Leu Pro Ala Ala Pro Val Ala Pro Leu Tyr Arg Val Asp Trp
1265 1270 1275 1280

Leu Pro Phe Pro Gly Pro Val Pro Val Ser Ala Gly Gly Arg Trp Ala
1285 1290 1295

Val Val Gly Pro Glu Ala Glu Ala Thr Ala Ala Gly Leu Arg Ala Val
1300 1305 1310

Gly Leu Asp Val Arg Thr His Ala Leu Pro Leu Gly Glu Pro Leu Pro
1315 1320 1325

Pro Gln Ala Gly Thr Asp Ala Glu Val Ile Ile Leu Asp Leu Thr Thr
1330 1335 1340

Thr Ala Ala Gly Arg Thr Ala Ser Asp Gly Gly Arg Leu Ser Leu Leu
1345 1350 1355 1360

Asp Glu Val Arg Ala Thr Val Arg Arg Thr Leu Glu Ala Val Gln Ala
1365 1370 1375

Arg Leu Ala Asp Thr Glu Thr Ala Pro Asp Val Asp Val Arg Thr Ala
1380 1385 1390

Ala Arg Pro Arg Thr Ala Ala Arg Thr Ser Pro Arg Val Asp Thr Arg
1395 1400 1405

Thr Gly Ala Arg Thr Ala Asp Gly Pro Arg Leu Val Val Leu Thr Arg
1410 1415 1420

Gly Ala Ala Gly Pro Glu Gly Gly Ala Ala Asp Pro Ala Gly Ala Ala
1425 1430 1435 1440

Val Trp Gly Leu Val Arg Val Ala Gln Ala Glu Gln Pro Gly Arg Phe
1445 1450 1455

Thr Leu Val Asp Val Asp Gly Thr Gln Ala Ser Leu Arg Ala Leu Pro
1460 1465 1470

Gly Leu Leu Ala Thr Asp Ala Gly Gln Ser Ala Val Arg Asp Gly Arg
1475 1480 1485
Val Thr Val Pro Arg Leu Val Pro Val Ala Asp Pro Val Pro His Gly
1490 1495 1500

Gly Gly Thr Ala Ala Asp Gly Thr Gly Ala Gly Glu Pro Ser Ala Thr
1505 1510 1515 1520

```
Leu Asp Pro Glu Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Ala Leu
                1525                1530                1535

Ala Ala Glu Thr Ala Arg His Leu Val Asp Arg His Lys Val Arg His
            1540                1545                1550

Leu Leu Leu Val Gly Arg Arg Gly Pro Asp Ala Pro Gly Val Asp Arg
        1555                1560                1565

Leu Val Ala Glu Leu Thr Glu Ser Gly Ala Glu Val Ala Val Arg Ala
    1570                1575                1580

Cys Asp Val Thr Asp Arg Asp Ala Leu Arg Arg Leu Leu Asp Ala Leu
1585                1590                1595                1600

Pro Asp Glu His Pro Leu Thr Cys Val Val His Thr Ala Gly Val Leu
                1605                1610                1615

Asp Asp Gly Val Leu Ser Ala Gln Thr Ala Glu Arg Ile Asp Thr Val
            1620                1625                1630

Leu Arg Pro Lys Ala Asp Ala Ala Val His Leu Asp Glu Leu Thr Arg
        1635                1640                1645

Glu Ile Gly Arg Val Pro Leu Val Leu Tyr Ser Ser Val Ser Ala Thr
    1650                1655                1660

Leu Gly Ser Ala Gly Gln Ala Gly Tyr Ala Ala Ala Asn Ala Phe Met
1665                1670                1675                1680

Asp Ala Leu Ala Ala Arg Arg Cys Ala Ala Gly His Pro Ala Leu Ser
                1685                1690                1695

Leu Gly Trp Gly Trp Trp Ser Gly Val Gly Leu Ala Thr Gly Leu Asp
            1700                1705                1710

Gly Ala Asp Ala Ala Arg Val Arg Arg Ser Gly Leu Ala Pro Leu Asp
        1715                1720                1725

Ala Gly Ala Ala Leu Asp Leu Leu Asp Arg Ala Leu Thr Arg Pro Glu
    1730                1735                1740

Pro Ala Leu Leu Pro Val Arg Leu Asp Leu Arg Ala Ala Ala Gly Ala
1745                1750                1755                1760

Thr Ala Leu Pro Glu Val Leu Arg Asp Leu Ala Gly Val Pro Ala Asp
                1765                1770                1775

Ala Arg Ser Thr Pro Gly Ala Ala Ala Gly Thr Gly Asp Glu Asp Gly
            1780                1785                1790

Ala Val Arg Pro Ala Pro Ala Pro Ala Asp Ala Ala Gly Thr Leu Ala
        1795                1800                1805

Ala Arg Leu Ala Gly Arg Ser Ala Pro Glu Arg Thr Ala Leu Leu Leu
    1810                1815                1820

Asp Leu Val Arg Thr Glu Val Ala Ala Val Leu Gly His Gly Asp Pro
1825                1830                1835                1840
```

```
Ala Ala Ile Gly Ala Ala Arg Thr Phe Lys Asp Ala Gly Phe Asp Ser
                1845                1850                1855

Leu Thr Ala Val Asp Leu Arg Asn Arg Leu Asn Thr Arg Thr Gly Leu
            1860                1865                1870

Arg Leu Pro Ala Thr Leu Val Phe Asp His Pro Thr Pro Leu Ala Leu
        1875                1880                1885

Ala Glu Leu Leu Leu Asp Gly Leu Glu Ala Ala Gly Pro Ala Glu Pro
    1890                1895                1900

Ala Ala Glu Val Pro Asp Glu Ala Ala Gly Ala Glu Thr Leu Ser Gly
1905                1910                1915                1920

Val Ile Asp Arg Leu Glu Arg Ser Leu Ala Ala Thr Asp Asp Gly Asp
                1925                1930                1935

Ala Arg Val Arg Ala Ala Arg Arg Leu Arg Gly Leu Leu Asp Ala Leu
            1940                1945                1950

Pro Ala Gly Pro Gly Ala Ala Ser Gly Pro Asp Ala Gly Glu His Ala
        1955                1960                1965

Pro Gly Arg Gly Asp Val Val Ile Asp Arg Leu Arg Ser Ala Ser Asp
    1970                1975                1980

Asp Asp Leu Phe Asp Leu Leu Asp Ser Asp Phe Gln
1985                1990                1995
```

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 3724 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

```
Met Ser Ala Thr Asn Glu Glu Lys Leu Arg Glu Tyr Leu Arg Arg Ala
1               5                   10                  15

Met Ala Asp Leu His Ser Ala Arg Glu Arg Leu Arg Glu Val Glu Ser
            20                  25                  30

Ala Ser Arg Glu Pro Ile Ala Ile Val Gly Met Ala Cys Arg Tyr Pro
        35                  40                  45

Gly Gly Val Ala Ser Pro Glu Glu Leu Trp Asp Leu Val Ala Ala Gly
    50                  55                  60

Thr Asp Ala Ile Ser Pro Phe Pro Val Asp Arg Gly Trp Asp Ala Glu
65                  70                  75                  80

Gly Leu Tyr Asp Pro Glu Pro Gly Val Pro Gly Lys Ser Tyr Val Arg
                85                  90                  95
```

```
Glu Gly Gly Phe Leu His Ser Ala Ala Glu Phe Asp Ala Glu Phe Phe
                100                 105                 110
Gly Ile Ser Pro Arg Glu Ala Ala Ala Met Asp Pro Gln Gln Arg Leu
        115                 120                 125

Leu Leu Glu Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly Ile Val Pro
    130                 135                 140

Ala Ser Leu Arg Gly Thr Arg Thr Gly Val Phe Thr Gly Val Met Tyr
145                 150                 155                 160

His Asp Tyr Gly Ser His Gln Val Gly Thr Ala Ala Asp Pro Ser Gly
                165                 170                 175

Gln Leu Gly Leu Gly Thr Ala Gly Ser Val Ala Ser Gly Arg Val Ala
            180                 185                 190

Tyr Thr Leu Gly Leu Gln Gly Pro Ala Val Thr Met Asp Thr Ala Cys
        195                 200                 205

Ser Ser Ser Leu Val Ala Leu His Leu Ala Val Gln Ser Leu Arg Arg
    210                 215                 220

Gly Glu Cys Asp Leu Ala Leu Ala Gly Gly Ala Thr Val Leu Ala Thr
225                 230                 235                 240

Pro Thr Val Phe Val Glu Phe Ser Arg Gln Arg Gly Leu Ala Ala Asp
                245                 250                 255

Gly Arg Cys Lys Ala Phe Ala Glu Gly Ala Asp Gly Thr Ala Trp Ala
            260                 265                 270

Glu Gly Ala Gly Val Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg
        275                 280                 285

Asn Gly His Arg Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln
    290                 295                 300

Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Ser Gly Pro Ala Gln Gln
305                 310                 315                 320

Arg Val Ile Arg Asp Ala Leu Ala Asp Ala Gly Leu Thr Pro Ala Asp
                325                 330                 335

Val Asp Ala Val Glu Ala His Gly Thr Gly Thr Pro Leu Gly Asp Pro
            340                 345                 350

Ile Glu Ala Gly Ala Leu Met Ala Thr Tyr Gly Ser Glu Arg Val Gly
        355                 360                 365

Asp Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Thr Gln
    370                 375                 380

Ala Ala Ala Gly Ala Ala Gly Val Ile Lys Met Val Gln Ala Leu Arg
385                 390                 395                 400

Gln Ser Glu Leu Pro Arg Thr Leu His Val Asp Ala Pro Ser Ala Lys
                405                 410                 415
```

Val Glu Trp Asp Ala Gly Ala Val Gln Leu Leu Thr Gly Val Arg Pro
420 425 430

Trp Pro Arg Arg Glu His Arg Pro Arg Arg Ala Ala Val Ser Ala Phe
435 440 445

Gly Val Ser Gly Thr Asn Ala His Val Ile Ile Glu Glu Pro Pro Ala
450 455 460

Ala Gly Asp Thr Ser Pro Ala Gly Asp Thr Pro Glu Pro Gly Glu Ala
465 470 475 480

Thr Ala Ser Pro Ser Thr Ala Ala Gly Pro Ser Ser Pro Ser Ala Val
485 490 495

Ala Gly Pro Leu Ser Pro Ser Ser Pro Ala Val Val Trp Pro Leu Ser
500 505 510

Ala Glu Thr Ala Pro Ala Leu Arg Ala Gln Ala Ala Arg Leu Arg Ala
515 520 525

His Leu Glu Arg Leu Pro Gly Thr Ser Pro Thr Asp Ile Gly His Ala
530 535 540

Leu Ala Ala Glu Arg Ala Ala Leu Thr Arg Arg Val Val Leu Leu Gly
545 550 555 560

Asp Asp Gly Ala Pro Val Asp Ala Leu Ala Ala Leu Ala Ala Gly Glu
565 570 575

Thr Thr Pro Asp Ala Val His Gly Thr Ala Ala Asp Ile Arg Arg Val
580 585 590

Ala Phe Val Phe Pro Gly Gln Gly Ser Gln Trp Ala Gly Met Gly Ala
595 600 605

Glu Leu Leu Asp Thr Ala Pro Ala Phe Ala Ala Glu Leu Asp Arg Cys
610 615 620

Gln Gly Ala Leu Ser Pro Tyr Val Asp Trp Asn Leu Ala Asp Val Leu
625 630 635 640

Arg Gly Ala Pro Ala Ala Pro Gly Leu Asp Arg Val Asp Val Val Gln
645 650 655

Pro Ala Thr Phe Ala Val Met Val Gly Leu Ala Ala Leu Trp Arg Ser
660 665 670

Leu Gly Val Glu Pro Ala Ala Val Ile Gly His Ser Gln Gly Glu Ile
675 680 685

Ala Ala Ala Cys Val Ala Gly Ala Leu Ser Leu Glu Asp Ala Ala Arg
690 695 700

Ile Val Ala Leu Arg Ser Gln Val Ile Ala Arg Glu Leu Ala Gly Arg
705 710 715 720

Gly Gly Met Ala Ser Val Ala Leu Pro Ala Ala Glu Val Glu Ala Arg
725 730 735

Leu Ala Gly Gly Val Glu Ile Ala Ala Val Asn Gly Pro Gly Ser Thr

740 745 750

Val Val Cys Gly Glu Pro Gly Ala Leu Glu Ala Leu Leu Val Thr Leu
755 760 765

Glu Ser Glu Gly Thr Arg Val Arg Arg Ile Asp Val Asp Tyr Ala Ser
770 775 780

His Ser His Tyr Val Glu Ser Ile Arg Ala Glu Leu Ala Thr Val Leu
785 790 795 800

Gly Pro Val Arg Pro Arg Arg Gly Asp Val Pro Phe Tyr Ser Thr Val
805 810 815

Glu Ala Ala Leu Leu Asp Thr Ala Thr Leu Asp Ala Asp Tyr Trp Tyr
820 825 830

Arg Asn Leu Arg Leu Pro Val Arg Phe Glu Pro Thr Val Arg Ala Met
835 840 845

Leu Asp Asp Gly Val Asp Ala Phe Val Glu Cys Ser Ala His Pro Val
850 855 860

Leu Thr Val Gly Val Arg Gln Thr Val Glu Ser Ala Gly Gly Ala Val
865 870 875 880

Pro Ala Leu Ala Ser Leu Arg Arg Asp Glu Gly Gly Leu Arg Arg Phe
885 890 895

Leu Thr Ser Ala Ala Glu Ala Gln Val Val Gly Val Pro Val Asp Trp
900 905 910

Ala Thr Leu Arg Pro Gly Ala Gly Arg Val Asp Leu Pro Thr Tyr Ala
915 920 925

Phe Gln Arg Glu Arg His Trp Val Gly Pro Ala Arg Pro Asp Ser Ala
930 935 940

Ala Thr Ala Ala Thr Thr Gly Asp Asp Ala Pro Glu Pro Gly Asp Arg
945 950 955 960

Leu Gly Tyr His Val Ala Trp Lys Gly Leu Arg Ser Thr Thr Gly Gly
965 970 975

Trp Arg Pro Gly Leu Arg Leu Leu Ile Val Pro Thr Gly Asp Gln Tyr
980 985 990

Thr Ala Leu Ala Asp Thr Leu Glu Gln Ala Val Ala Ser Phe Gly Gly
995 1000 1005

Thr Val Arg Arg Val Ala Phe Asp Pro Ala Arg Thr Gly Arg Ala Glu
1010 1015 1020

Leu Phe Gly Leu Leu Glu Thr Glu Ile Asn Gly Asp Thr Ala Val Thr
1025 1030 1035 1040

Gly Val Val Ser Leu Leu Gly Leu Cys Thr Asp Gly Arg Pro Asp His
1045 1050 1055

Pro Ala Val Pro Val Ala Val Thr Ala Thr Leu Ala Leu Val Gln Ala
1060 1065 1070

```
Leu Ala Asp Leu Gly Ser Thr Ala Pro Leu Trp Thr Val Thr Cys Gly
        1075                1080                1085

Ala Val Ala Thr Ala Pro Asp Glu Leu Pro Cys Thr Ala Gly Ala Gln
    1090                1095                1100

Leu Trp Gly Leu Gly Arg Val Ala Ala Leu Glu Leu Pro Glu Val Trp
1105                1110                1115                1120

Gly Gly Leu Ile Asp Leu Pro Ala Arg Pro Asp Ala Arg Val Leu Asp
                1125                1130                1135

Arg Leu Ala Gly Val Leu Ala Glu Pro Gly Gly Glu Asp Gln Ile Ala
            1140                1145                1150

Val Arg Met Ala Gly Val Phe Gly Arg Arg Val Leu Arg Asn Pro Ala
        1155                1160                1165
Asp Ser Arg Pro Pro Ala Trp Arg Ala Arg Gly Thr Val Leu Ile Ala
    1170                1175                1180

Gly Asp Leu Thr Thr Val Pro Gly Arg Leu Val Arg Ser Leu Leu Glu
1185                1190                1195                1200

Asp Gly Ala Asp Arg Val Val Leu Ala Gly Pro Asp Ala Pro Ala Gln
                1205                1210                1215

Ala Ala Ala Ala Gly Leu Thr Gly Val Ser Leu Val Pro Val Arg Cys
            1220                1225                1230

Asp Val Thr Asp Arg Ala Ala Leu Ala Ala Leu Leu Asp Glu His Ala
        1235                1240                1245

Pro Thr Val Ala Val His Ala Pro Pro Leu Val Pro Leu Ala Pro Leu
    1250                1255                1260

Arg Glu Thr Ala Pro Gly Asp Ile Ala Ala Ala Leu Ala Ala Lys Thr
1265                1270                1275                1280

Thr Ala Ala Gly His Leu Val Asp Leu Ala Pro Ala Ala Gly Leu Asp
                1285                1290                1295

Ala Leu Val Leu Phe Ser Ser Val Ser Gly Val Trp Gly Gly Ala Ala
            1300                1305                1310

Gln Gly Gly Tyr Ala Ala Ala Ser Ala His Leu Asp Ala Leu Ala Glu
        1315                1320                1325

Arg Ala Arg Ala Ala Gly Val Pro Ala Phe Ser Val Ala Trp Ser Pro
    1330                1335                1340

Trp Ala Gly Gly Thr Pro Ala Asp Gly Ala Glu Ala Glu Phe Leu Ser
1345                1350                1355                1360

Arg Arg Gly Leu Ala Pro Leu Asp Pro Asp Gln Ala Val Arg Thr Leu
                1365                1370                1375

Arg Arg Met Leu Glu Arg Gly Ser Ala Cys Gly Ala Val Ala Asp Val
            1380                1385                1390
```

Glu Trp Ser Arg Phe Ala Ala Ser Tyr Thr Trp Val Arg Pro Ala Val
1395 1400 1405

Leu Phe Asp Asp Ile Pro Asp Val Gln Arg Leu Arg Ala Ala Glu Leu
1410 1415 1420

Ala Pro Ser Thr Gly Asp Ser Thr Thr Ser Glu Leu Val Arg Glu Leu
1425 1430 1435 1440

Thr Ala Gln Ser Gly His Lys Arg His Ala Thr Leu Leu Arg Leu Val
1445 1450 1455

Arg Ala His Ala Ala Ala Val Leu Gly Gln Ser Ser Gly Asp Ala Val
1460 1465 1470

Ser Ser Ala Arg Ala Phe Arg Asp Leu Gly Phe Asp Ser Leu Thr Ala
1475 1480 1485

Leu Glu Leu Arg Asp Arg Leu Ser Thr Ser Thr Gly Leu Lys Leu Pro
1490 1495 1500

Thr Ser Leu Val Phe Asp His Ser Ser Pro Ala Ala Leu Ala Arg His
1505 1510 1515 1520
Leu Gly Glu Glu Leu Leu Gly Arg Asn Asp Thr Ala Asp Arg Ala Gly
1525 1530 1535

Pro Asp Thr Pro Val Arg Thr Asp Glu Pro Ile Ala Ile Ile Gly Met
1540 1545 1550

Ala Cys Arg Leu Pro Gly Gly Val Gln Ser Pro Glu Asp Leu Trp Asp
1555 1560 1565

Leu Leu Thr Gly Gly Thr Asp Ala Ile Thr Pro Phe Pro Thr Asn Arg
1570 1575 1580

Gly Trp Asp Asn Glu Thr Leu Tyr Asp Pro Asp Pro Asp Ser Pro Gly
1585 1590 1595 1600

His His Thr Tyr Val Arg Glu Gly Gly Phe Leu His Asp Ala Ala Glu
1605 1610 1615

Phe Asp Pro Gly Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu Ala Met
1620 1625 1630

Asp Pro Gln Gln Arg Leu Ile Leu Glu Thr Ser Trp Glu Ser Phe Glu
1635 1640 1645

Arg Ala Gly Ile Asp Pro Val Glu Leu Arg Gly Ser Arg Thr Gly Val
1650 1655 1660

Phe Val Gly Thr Asn Gly Gln His Tyr Val Pro Leu Leu Gln Asp Gly
1665 1670 1675 1680

Asp Glu Asn Phe Asp Gly Tyr Ile Ala Thr Gly Asn Ser Ala Ser Val
1685 1690 1695

Met Ser Gly Arg Leu Ser Tyr Val Phe Gly Leu Glu Gly Pro Ala Val
1700 1705 1710

Thr Val Asp Thr Ala Cys Ser Ala Ser Leu Ala Ala Leu His Leu Ala

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        1715                1720                1725

Val Gln Ser Leu Arg Arg Gly Glu Cys Asp Tyr Ala Leu Ala Gly Gly
    1730                1735                1740

Ala Thr Val Met Ser Thr Pro Glu Met Leu Val Glu Phe Ala Arg Gln
1745                1750                1755                1760

Arg Ala Val Ser Pro Asp Gly Arg Ser Lys Ala Phe Ala Glu Ala Ala
                1765                1770                1775

Asp Gly Val Gly Leu Ala Glu Gly Ala Gly Met Leu Leu Val Glu Arg
            1780                1785                1790

Leu Ser Glu Ala Gln Lys Lys Gly His Pro Val Leu Ala Val Val Arg
        1795                1800                1805

Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro
    1810                1815                1820

Ser Gly Pro Ala Gln Gln Arg Val Ile Arg Glu Ala Leu Ala Asp Ala
1825                1830                1835                1840

Gly Leu Thr Pro Ala Asp Val Asp Ala Val Glu Ala His Gly Thr Gly
                1845                1850                1855

Thr Pro Leu Gly Asp Pro Ile Glu Ala Gly Ala Leu Leu Ala Thr Tyr
            1860                1865                1870
Gly Arg Asp Arg Arg Asp Gly Pro Leu Trp Leu Gly Ser Leu Lys Ser
        1875                1880                1885

Asn Ile Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys
    1890                1895                1900

Met Val Leu Ala Leu Arg His Gly Glu Leu Pro Arg Thr Leu His Ala
1905                1910                1915                1920

Ser Thr Ala Ser Ser Arg Ile Asp Trp Asp Ala Gly Ala Val Glu Leu
                1925                1930                1935

Leu Asp Glu Ala Arg Pro Trp Leu Gln Arg Ala Glu Gly Pro Arg Arg
            1940                1945                1950

Ala Gly Ile Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala His Leu Val
        1955                1960                1965

Ile Glu Glu Pro Pro Glu Pro Thr Ala Pro Glu Leu Leu Ala Pro Glu
    1970                1975                1980

Pro Ala Ala Asp Gly Asp Val Trp Ser Glu Glu Trp Trp His Glu Val
1985                1990                1995                2000

Thr Val Pro Leu Met Met Ser Ala His Asn Glu Ala Ala Leu Arg Asp
                2005                2010                2015

Gln Ala Arg Arg Leu Arg Ala Asp Leu Leu Ala His Pro Glu Leu His
            2020                2025                2030

Pro Ala Asp Val Gly Tyr Thr Leu Ile Thr Thr Arg Thr Arg Phe Glu
        2035                2040                2045
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Gln Arg Ala Ala Val Val Gly Glu Asn Phe Thr Glu Leu Ile Ala Ala
    2050                2055                2060

Leu Asp Asp Leu Val Glu Gly Arg Pro His Pro Leu Val Leu Arg Gly
2065                2070                2075                2080

Thr Ala Gly Thr Ser Asp Gln Val Val Phe Val Phe Pro Gly Gln Gly
                2085                2090                2095

Ser Gln Trp Pro Glu Met Ala Asp Gly Leu Leu Ala Arg Ser Ser Gly
            2100                2105                2110

Ser Gly Ser Phe Leu Glu Thr Ala Arg Ala Cys Asp Leu Ala Leu Arg
        2115                2120                2125

Pro His Leu Gly Trp Ser Val Leu Asp Val Leu Arg Arg Glu Pro Gly
    2130                2135                2140

Ala Pro Ser Leu Asp Arg Val Asp Val Val Gln Pro Val Leu Phe Thr
2145                2150                2155                2160

Met Met Val Ser Leu Ala Glu Thr Trp Arg Ser Leu Gly Val Glu Pro
                2165                2170                2175

Ala Ala Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Ala Tyr Val
            2180                2185                2190

Ala Gly Ala Leu Thr Leu Asp Asp Ala Ala Arg Ile Val Ala Leu Arg
        2195                2200                2205

Ser Gln Ala Trp Leu Arg Leu Ala Gly Lys Gly Gly Met Val Ala Val
    2210                2215                2220
Thr Leu Ser Glu Arg Asp Leu Arg Pro Arg Leu Glu Pro Trp Ser Asp
2225                2230                2235                2240

Arg Leu Ala Val Ala Ala Val Asn Gly Pro Glu Thr Cys Ala Val Ser
                2245                2250                2255

Gly Asp Pro Asp Ala Leu Ala Glu Leu Val Ala Glu Leu Gly Ala Glu
            2260                2265                2270

Gly Val His Ala Arg Pro Ile Pro Gly Val Asp Thr Ala Gly His Ser
        2275                2280                2285

Pro Gln Val Asp Thr Leu Glu Ala His Leu Arg Lys Val Leu Ala Pro
    2290                2295                2300

Val Ala Pro Arg Thr Ser Asp Ile Pro Phe Tyr Ser Thr Val Thr Gly
2305                2310                2315                2320

Gly Leu Ile Asp Thr Ala Glu Leu Asp Ala Asp Tyr Trp Tyr Arg Asn
                2325                2330                2335

Met Arg Glu Pro Val Glu Phe Glu Gln Ala Thr Arg Ala Leu Ile Ala
            2340                2345                2350

Asp Gly His Asp Val Phe Leu Glu Ser Ser Pro His Pro Met Leu Ala
        2355                2360                2365
```

Val Ser Leu Gln Glu Thr Ile Ser Asp Ala Gly Ser Pro Ala Ala Val
2370 2375 2380

Leu Gly Thr Leu Arg Arg Gly Gln Gly Gly Pro Arg Trp Leu Gly Val
2385 2390 2395 2400

Ala Leu Cys Arg Ala Tyr Thr His Gly Leu Glu Ile Asp Ala Glu Ala
2405 2410 2415

Ile Phe Gly Pro Asp Ser Arg Gln Val Glu Leu Pro Thr Tyr Pro Phe
2420 2425 2430

Gln Arg Glu Arg Tyr Trp Tyr Ser Pro Gly His Arg Gly Asp Asp Pro
2435 2440 2445

Ala Ser Leu Gly Leu Asp Ala Val Asp His Pro Leu Leu Gly Ser Gly
2450 2455 2460

Val Glu Leu Pro Glu Ser Gly Asp Arg Met Tyr Thr Ala Arg Leu Gly
2465 2470 2475 2480

Ala Asp Thr Thr Pro Trp Leu Ala Asp His Ala Leu Leu Gly Ser Pro
2485 2490 2495

Leu Leu Pro Gly Ala Ala Phe Ala Asp Leu Ala Leu Trp Ala Gly Arg
2500 2505 2510

Gln Ala Gly Thr Gly Arg Val Glu Glu Leu Thr Leu Ala Ala Pro Leu
2515 2520 2525

Val Leu Pro Gly Ser Gly Gly Val Arg Leu Arg Leu Asn Val Gly Ala
2530 2535 2540

Pro Gly Thr Asp Asp Ala Arg Arg Phe Ala Val His Ala Arg Ala Glu
2545 2550 2555 2560

Gly Ala Thr Asp Trp Thr Leu His Ala Glu Gly Leu Leu Thr Ala Gln
2565 2570 2575
Asp Thr Ala Asp Ala Pro Asp Ala Ser Ala Ala Thr Pro Pro Pro Gly
2580 2585 2590

Ala Glu Gln Leu Asp Ile Gly Asp Phe Tyr Gln Arg Phe Ser Glu Leu
2595 2600 2605

Gly Tyr Gly Tyr Gly Pro Phe Phe Arg Gly Leu Val Ser Ala His Arg
2610 2615 2620

Cys Gly Pro Asp Ile His Ala Glu Val Ala Leu Pro Val Gln Ala Gln
2625 2630 2635 2640

Gly Asp Ala Ala Arg Phe Gly Ile His Pro Ala Leu Leu Asp Ala Ala
2645 2650 2655

Leu Gln Thr Met Ser Leu Gly Gly Phe Phe Pro Glu Asp Gly Arg Val
2660 2665 2670

Arg Met Pro Phe Ala Leu Arg Gly Val Arg Leu Tyr Arg Ala Gly Ala
2675 2680 2685

Asp Arg Leu His Val Arg Val Ser Pro Val Ser Glu Asp Ala Val Arg

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    2690                2695                2700

Ile Arg Cys Ala Asp Gly Glu Gly Arg Pro Val Ala Glu Ile Glu Ser
2705                2710                2715                2720

Phe Ile Met Arg Pro Val Asp Pro Gly Gln Leu Leu Gly Gly Arg Pro
                2725                2730                2735

Val Gly Ala Asp Ala Leu Phe Arg Ile Ala Trp Arg Glu Leu Ala Ala
            2740                2745                2750

Gly Pro Gly Thr Arg Thr Gly Asp Gly Thr Pro Pro Pro Val Arg Trp
        2755                2760                2765

Val Leu Ala Gly Pro Asp Ala Leu Gly Leu Ala Glu Ala Ala Asp Ala
    2770                2775                2780

His Leu Pro Ala Val Pro Gly Pro Asp Gly Ala Leu Pro Ser Pro Thr
2785                2790                2795                2800

Gly Arg Pro Ala Pro Asp Ala Val Val Phe Ala Val Arg Ala Gly Thr
                2805                2810                2815

Gly Asp Val Ala Ala Asp Ala His Thr Val Ala Cys Arg Val Leu Asp
            2820                2825                2830

Leu Val Gln Arg Arg Leu Ala Ala Pro Glu Gly Pro Asp Gly Ala Arg
        2835                2840                2845

Leu Val Val Ala Thr Arg Gly Ala Val Ala Val Arg Asp Asp Ala Glu
    2850                2855                2860

Val Asp Asp Pro Ala Ala Ala Ala Ala Trp Gly Leu Leu Arg Ser Ala
2865                2870                2875                2880

Gln Ala Glu Glu Pro Gly Arg Phe Leu Leu Val Asp Leu Asp Asp Asp
                2885                2890                2895

Pro Ala Ser Ala Arg Ala Leu Thr Asp Ala Leu Ala Ser Gly Glu Pro
            2900                2905                2910

Gln Thr Ala Val Arg Ala Gly Thr Val Tyr Val Pro Arg Leu Glu Arg
        2915                2920                2925
Ala Ala Asp Arg Thr Asp Gly Pro Leu Thr Pro Pro Asp Asp Gly Ala
    2930                2935                2940

Trp Arg Leu Gly Arg Gly Thr Asp Leu Thr Leu Asp Gly Leu Ala Leu
2945                2950                2955                2960

Val Pro Ala Pro Asp Ala Glu Ala Pro Leu Glu Pro Gly Gln Val Arg
                2965                2970                2975

Val Ala Val Arg Ala Ala Gly Val Asn Phe Arg Asp Ala Leu Ile Ala
            2980                2985                2990

Leu Gly Met Tyr Pro Gly Glu Ala Glu Met Gly Thr Glu Gly Ala Gly
        2995                3000                3005

Thr Val Val Glu Val Gly Pro Gly Val Thr Gly Val Ala Val Gly Asp
    3010                3015                3020
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Arg Val Leu Gly Leu Trp Asp Gly Gly Leu Gly Pro Leu Cys Val Ala
3025 3030 3035 3040

Asp His Arg Leu Leu Ala Pro Val Pro Asp Gly Trp Ser Tyr Ala Gln
3045 3050 3055

Ala Ala Ser Val Pro Ala Val Phe Leu Ser Ala Tyr Tyr Gly Leu Val
3060 3065 3070

Thr Leu Ala Gly Leu Arg Pro Gly Glu Arg Val Leu Val His Ala Ala
3075 3080 3085

Ala Gly Gly Val Gly Met Ala Ala Val Gln Ile Ala Arg His Leu Gly
3090 3095 3100

Ala Glu Val Leu Ala Thr Ala Ser Pro Gly Lys Trp Asp Ala Leu Arg
3105 3110 3115 3120

Ala Met Gly Ile Thr Asp Asp His Leu Ala Ser Ser Arg Thr Leu Asp
3125 3130 3135

Phe Ala Thr Ala Phe Thr Gly Ala Asp Gly Thr Ser Arg Ala Asp Val
3140 3145 3150

Val Leu Asn Ser Leu Thr Lys Glu Phe Val Asp Ala Ser Leu Gly Leu
3155 3160 3165

Leu Arg Pro Gly Gly Arg Phe Leu Glu Leu Gly Lys Thr Asp Val Arg
3170 3175 3180

Asp Pro Glu Arg Ile Ala Ala Glu His Pro Gly Val Arg Tyr Arg Ala
3185 3190 3195 3200

Phe Asp Leu Asn Glu Ala Gly Pro Asp Ala Leu Gly Arg Leu Leu Arg
3205 3210 3215

Glu Leu Met Asp Leu Phe Ala Ala Gly Val Leu His Pro Leu Pro Val
3220 3225 3230

Val Thr His Asp Val Arg Arg Ala Ala Asp Ala Leu Arg Thr Ile Ser
3235 3240 3245

Gln Ala Arg His Thr Gly Lys Leu Val Leu Thr Met Pro Pro Ala Trp
3250 3255 3260

His Pro Tyr Gly Thr Val Leu Val Thr Gly Gly Thr Gly Ala Leu Gly
3265 3270 3275 3280
Ser Arg Ile Ala Arg His Leu Ala Ser Arg His Gly Val Arg Arg Leu
3285 3290 3295

Leu Ile Ala Ala Arg Arg Gly Pro Asp Gly Glu Gly Ala Ala Glu Leu
3300 3305 3310

Val Ala Asp Leu Ala Ala Leu Gly Ala Ser Ala Thr Val Val Ala Cys
3315 3320 3325

Asp Val Ser Asp Ala Asp Ala Val Arg Gly Leu Leu Ala Gly Ile Pro
3330 3335 3340

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Ala Asp His Pro Leu Thr Ala Val Val His Ser Thr Gly Val Leu Asp
3345                3350                3355                3360

Asp Gly Val Leu Pro Gly Leu Thr Pro Glu Arg Met Arg Arg Val Leu
                3365                3370                3375

Arg Pro Lys Val Glu Ala Ala Val His Leu Asp Glu Leu Thr Arg Asp
            3380                3385                3390

Leu Asp Leu Ser Ala Phe Val Leu Phe Ser Ser Ser Ala Gly Leu Leu
        3395                3400                3405

Gly Ser Pro Ala Gln Gly Asn Tyr Ala Ala Ala Asn Ala Thr Leu Asp
    3410                3415                3420

Ala Leu Ala Ala Arg Arg Arg Ser Leu Gly Leu Pro Ser Val Ser Leu
3425                3430                3435                3440

Ala Trp Gly Leu Trp Ser Asp Thr Ser Arg Met Ala His Ala Leu Asp
                3445                3450                3455

Gln Glu Ser Leu Gln Arg Arg Phe Ala Arg Ser Gly Phe Pro Pro Leu
            3460                3465                3470

Ser Ala Thr Leu Gly Ala Ala Leu Phe Asp Ala Ala Leu Arg Val Asp
        3475                3480                3485

Glu Ala Val Gln Val Pro Met Arg Phe Asp Pro Ala Ala Leu Arg Ala
    3490                3495                3500

Thr Gly Ser Val Pro Ala Leu Leu Ser Asp Leu Val Gly Ser Ala Pro
3505                3510                3515                3520

Ala Thr Gly Ser Ala Ala Pro Ala Ser Gly Pro Leu Pro Ala Pro Asp
                3525                3530                3535

Ala Gly Thr Val Gly Glu Pro Leu Ala Glu Arg Leu Ala Gly Leu Ser
            3540                3545                3550

Ala Glu Glu Arg His Asp Arg Leu Leu Gly Leu Val Gly Glu His Val
        3555                3560                3565

Ala Ala Val Leu Gly His Gly Ser Ala Ala Glu Val Arg Pro Asp Arg
    3570                3575                3580

Pro Phe Arg Glu Val Gly Phe Asp Ser Leu Thr Ala Val Glu Leu Arg
3585                3590                3595                3600

Asn Arg Met Ala Ala Val Thr Gly Val Arg Leu Pro Ala Thr Leu Val
                3605                3610                3615

Phe Asp His Pro Thr Pro Ala Ala Leu Ser Ser His Leu Asp Gly Leu
            3620                3625                3630
Leu Ala Pro Ala Gln Pro Val Thr Thr Thr Pro Leu Leu Ser Glu Leu
        3635                3640                3645

Asp Arg Ile Glu Glu Ala Leu Ala Ala Leu Thr Pro Glu His Leu Ala
    3650                3655                3660

Glu Leu Ala Pro Ala Pro Asp Asp Arg Ala Glu Val Ala Leu Arg Leu
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3665 3670 3675 3680

Asp Ala Leu Ala Asp Arg Trp Arg Ala Leu His Asp Gly Ala Pro Gly
3685 3690 3695

Ala Asp Asp Asp Ile Thr Asp Val Leu Ser Ser Ala Asp Asp Asp Glu
3700 3705 3710

Ile Phe Ala Phe Ile Asp Glu Arg Tyr Gly Thr Ser
3715 3720

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1580 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Met Ala Asn Glu Glu Lys Leu Arg Ala Tyr Leu Lys Arg Val Thr Gly
1 5 10 15

Glu Leu His Arg Ala Thr Glu Gln Leu Arg Ala Leu Asp Arg Arg Ala
20 25 30

His Glu Pro Ile Ala Ile Val Gly Ala Ala Cys Arg Leu Pro Gly Gly
35 40 45

Val Glu Ser Pro Asp Asp Leu Trp Glu Leu Leu His Ala Gly Ala Asp
50 55 60

Ala Val Gly Pro Ala Pro Ala Asp Arg Gly Trp Asp Val Glu Gly Arg
65 70 75 80

Tyr Ser Pro Asp Pro Asp Thr Pro Gly Thr Ser Tyr Cys Arg Glu Gly
85 90 95

Gly Phe Val Gln Gly Ala Asp Arg Phe Asp Pro Ala Leu Phe Gly Ile
100 105 110

Ser Pro Asn Glu Ala Leu Thr Met Asp Pro Gln Gln Arg Leu Leu Leu
115 120 125

Glu Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly Leu Asp Pro Gln Ser
130 135 140

Leu Ala Gly Ser Arg Thr Gly Val Phe Ala Gly Ala Trp Glu Ser Gly
145 150 155 160

Tyr Gln Lys Gly Val Glu Gly Leu Glu Ala Asp Leu Glu Ala Gln Leu
165 170 175

Leu Ala Gly Ile Val Ser Phe Thr Ala Gly Arg Val Ala Tyr Ala Leu
180 185 190

Gly Leu Glu Gly Pro Ala Leu Thr Ile Asp Thr Ala Cys Ser Ser Ser

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        195                 200                 205

Leu Val Ala Leu His Leu Ala Val Gln Ser Leu Arg Arg Gly Glu Cys
    210                 215                 220

Asp Leu Ala Leu Ala Gly Gly Ala Thr Val Ile Ala Asp Phe Ala Leu
225                 230                 235                 240

Phe Thr Gln Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys
                245                 250                 255

Lys Ala Phe Gly Glu Thr Ala Asp Gly Phe Gly Pro Ala Glu Gly Ala
            260                 265                 270

Gly Met Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly His
        275                 280                 285

Pro Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp Gly Ala
    290                 295                 300

Ser Asn Gly Leu Thr Ala Pro Ser Gly Pro Ala Gln Gln Arg Val Ile
305                 310                 315                 320

Arg Glu Ala Leu Ala Asp Ala Gly Leu Thr Pro Ala Asp Val Asp Ala
                325                 330                 335

Val Glu Ala His Gly Thr Gly Thr Pro Leu Gly Asp Pro Ile Glu Ala
            340                 345                 350

Gly Ala Leu Met Ala Thr Tyr Gly His Glu Arg Thr Gly Asp Pro Leu
        355                 360                 365

Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala
    370                 375                 380

Gly Val Ala Gly Val Ile Lys Met Val Leu Ala Leu Arg His Gly Glu
385                 390                 395                 400

Leu Pro Arg Thr Leu His Ala Ser Thr Ala Ser Ser Arg Ile Glu Trp
                405                 410                 415

Asp Ala Gly Ala Val Glu Leu Leu Asp Glu Ala Arg Pro Trp Pro Arg
            420                 425                 430

Arg Ala Glu Gly Pro Arg Arg Ala Gly Ile Ser Ser Phe Gly Ile Ser
        435                 440                 445

Gly Thr Asn Ala His Leu Val Ile Glu Glu Glu Pro Pro Ala Arg Pro
    450                 455                 460

Glu Pro Glu Glu Ala Ala Gln Pro Pro Ala Pro Ala Thr Thr Val Leu
465                 470                 475                 480

Pro Leu Ser Ala Ala Gly Ala Arg Ser Leu Arg Glu Gln Ala Arg Arg
                485                 490                 495

Leu Ala Ala His Leu Ala Gly His Glu Glu Ile Thr Ala Ala Asp Ala
            500                 505                 510

Ala Arg Ser Ala Ala Thr Thr Arg Ala Ala Leu Ser His Arg Ala Ser
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        515                 520                 525
Val Leu Ala Asp Asp Arg Arg Ala Leu Ile Asp Arg Leu Thr Ala Leu
    530                 535                 540

Ala Glu Asp Arg Lys Asp Pro Gly Val Thr Val Gly Glu Ala Gly Ser
545                 550                 555                 560

Gly Arg Pro Pro Val Phe Val Phe Pro Gly Gln Gly Ser Gln Trp Thr
                565                 570                 575

Gly Met Gly Ala Glu Leu Leu Asp Arg Ala Pro Val Phe Arg Ala Lys
            580                 585                 590

Ala Glu Glu Cys Ala Arg Ala Leu Ala Ala His Leu Asp Trp Ser Val
        595                 600                 605

Leu Asp Val Leu Arg Asp Ala Pro Gly Ala Pro Pro Ile Asp Arg Ala
    610                 615                 620

Asp Val Val Gln Pro Thr Leu Phe Thr Met Met Val Ser Leu Ala Ala
625                 630                 635                 640

Leu Trp Glu Ser His Gly Val Arg Pro Ala Ala Val Val Gly His Ser
                645                 650                 655

Gln Gly Glu Ile Ala Ala Ala His Ala Ala Gly Ala Leu Ser Leu Asp
            660                 665                 670

Asp Ala Ala Arg Val Ile Ala Glu Arg Ser Arg Leu Trp Lys Arg Leu
        675                 680                 685

Ala Gly Asn Gly Gly Met Leu Ser Val Met Ala Pro Ala Asp Arg Val
    690                 695                 700

Arg Glu Leu Met Glu Pro Trp Ala Glu Arg Met Ser Val Ala Ala Val
705                 710                 715                 720

Asn Gly Pro Ala Ser Val Thr Val Ala Gly Asp Ala Arg Ala Leu Glu
                725                 730                 735

Glu Phe Gly Gly Arg Leu Ser Ala Ala Gly Val Leu Arg Trp Pro Leu
            740                 745                 750

Ala Gly Val Asp Phe Ala Gly His Ser Pro Gln Val Glu Gln Phe Arg
        755                 760                 765

Ala Glu Leu Leu Asp Thr Leu Gly Thr Val Arg Pro Thr Ala Ala Arg
    770                 775                 780

Leu Pro Phe Phe Ser Thr Val Thr Ala Ala Ala His Glu Pro Glu Gly
785                 790                 795                 800

Leu Asp Ala Ala Tyr Trp Tyr Arg Asn Met Arg Glu Pro Val Glu Phe
                805                 810                 815

Ala Ser Thr Leu Arg Thr Leu Leu Arg Glu Gly His Arg Thr Phe Val
            820                 825                 830

Glu Met Gly Pro His Pro Leu Leu Gly Ala Ala Ile Asp Glu Val Ala
        835                 840                 845
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Glu Ala Glu Gly Val His Ala Thr Ala Leu Ala Thr Leu His Arg Gly
    850                 855                 860

Ser Gly Gly Leu Asp Arg Phe Arg Ser Ser Val Gly Ala Ala Phe Ala
865                 870                 875                 880
His Gly Val Arg Val Asp Trp Asp Ala Leu Phe Glu Gly Ser Gly Ala
                885                 890                 895

Arg Arg Val Pro Leu Pro Thr Tyr Ala Phe Ser Arg Asp Arg Tyr Trp
            900                 905                 910

Leu Pro Thr Ala Ile Gly Arg Arg Ala Val Glu Ala Ala Pro Val Asp
        915                 920                 925

Ala Ser Ala Pro Gly Arg Tyr Arg Val Thr Trp Thr Pro Val Ala Ser
    930                 935                 940

Asp Asp Ser Gly Arg Pro Ser Gly Arg Trp Leu Leu Val Gln Thr Pro
945                 950                 955                 960

Gly Thr Ala Pro Asp Glu Ala Asp Thr Ala Ala Ser Ala Leu Gly Ala
                965                 970                 975

Ala Gly Val Val Val Glu Arg Cys Leu Leu Asp Pro Thr Glu Ala Ala
            980                 985                 990

Arg Val Thr Leu Thr Glu Arg Leu Ala Glu Leu Asp Ala Gln Pro Glu
        995                 1000                1005

Gly Leu Ala Gly Val Leu Val Leu Pro Gly Arg Pro Gln Ser Thr Ala
    1010                1015                1020

Pro Ala Asp Ala Ser Pro Leu Asp Pro Gly Thr Ala Ala Val Leu Leu
1025                1030                1035                1040

Val Val Gln Ala Val Pro Asp Ala Ala Pro Lys Ala Arg Ile Trp Val
                1045                1050                1055

Val Thr Arg Gly Ala Val Ala Val Gly Ser Gly Glu Val Pro Cys Ala
            1060                1065                1070

Val Gly Ala Arg Val Trp Gly Leu Gly Arg Val Ala Ala Leu Glu Val
        1075                1080                1085

Pro Val Gln Trp Gly Gly Leu Val Asp Val Ala Val Gly Ala Gly Val
    1090                1095                1100

Arg Glu Trp Arg Arg Val Val Gly Val Val Ala Gly Gly Gly Glu Asp
1105                1110                1115                1120

Gln Val Ala Val Arg Gly Gly Gly Val Phe Gly Arg Arg Leu Val Gly
                1125                1130                1135

Val Gly Val Arg Gly Gly Ser Gly Val Trp Arg Ala Arg Gly Cys Val
            1140                1145                1150

Val Val Thr Gly Gly Leu Gly Gly Val Gly Gly His Val Ala Arg Trp
        1155                1160                1165
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Leu Ala Arg Ser Gly Ala Glu His Val Val Leu Ala Gly Arg Arg Gly
    1170                1175                1180

Gly Gly Val Val Gly Ala Val Glu Leu Glu Arg Glu Leu Val Gly Leu
1185                1190                1195                1200

Gly Ala Lys Val Thr Phe Val Ser Cys Asp Val Gly Asp Arg Ala Ser
                1205                1210                1215

Met Val Gly Leu Leu Gly Val Val Glu Gly Leu Gly Val Pro Leu Arg
            1220                1225                1230
Gly Val Phe His Ala Ala Gly Val Ala Gln Val Ser Gly Leu Gly Glu
        1235                1240                1245

Val Ser Leu Ala Glu Ala Gly Gly Val Leu Gly Gly Lys Ala Val Gly
    1250                1255                1260

Ala Glu Leu Leu Asp Glu Leu Thr Ala Gly Val Glu Leu Asp Ala Phe
1265                1270                1275                1280

Val Leu Phe Ser Ser Gly Ala Gly Val Trp Gly Ser Gly Gly Gln Ser
                1285                1290                1295

Val Tyr Ala Ala Ala Asn Ala His Leu Asp Ala Leu Ala Glu Arg Arg
            1300                1305                1310

Arg Ala Gln Gly Arg Pro Ala Thr Ser Val Ala Trp Gly Leu Trp Gly
        1315                1320                1325

Gly Glu Gly Met Gly Ala Asp Glu Gly Val Thr Glu Phe Tyr Ala Glu
    1330                1335                1340

Arg Gly Leu Ala Pro Met Arg Pro Glu Ser Gly Ile Glu Ala Leu His
1345                1350                1355                1360

Thr Ala Leu Asn Glu Gly Asp Thr Cys Val Thr Val Ala Asp Ile Asp
                1365                1370                1375

Trp Glu His Phe Val Thr Gly Phe Thr Ala Tyr Arg Pro Ser Pro Leu
            1380                1385                1390

Ile Ser Asp Ile Pro Gln Val Arg Ala Leu Arg Thr Pro Glu Pro Thr
        1395                1400                1405

Val Asp Ala Ser Asp Gly Leu Arg Arg Arg Val Asp Ala Ala Leu Thr
    1410                1415                1420

Pro Arg Glu Arg Thr Lys Val Leu Val Asp Leu Val Arg Thr Val Ala
1425                1430                1435                1440

Ala Glu Val Leu Gly His Asp Gly Ile Gly Gly Ile Gly His Asp Val
                1445                1450                1455

Ala Phe Arg Asp Leu Gly Phe Asp Ser Leu Ala Ala Val Arg Met Arg
            1460                1465                1470

Gly Arg Leu Ala Glu Ala Thr Gly Leu Val Leu Pro Ala Thr Val Ile
        1475                1480                1485

Phe Asp His Pro Thr Val Asp Arg Leu Gly Gly Ala Leu Leu Glu Arg
```

1490 1495 1500

Leu Ser Ala Asp Glu Pro Ala Pro Gly Gly Ala Pro Glu Pro Ala Gly
1505 1510 1515 1520

Gly Arg Pro Ala Thr Pro Pro Pro Ala Pro Glu Pro Ala Val His Asp
1525 1530 1535

Ala Asp Ile Asp Glu Leu Asp Ala Asp Ala Leu Ile Arg Leu Ala Thr
1540 1545 1550

Gly Thr Ala Gly Pro Ala Asp Gly Thr Pro Ala Asp Gly Gly Pro Asp
1555 1560 1565

Ala Ala Ala Thr Ala Pro Asp Gly Ala Pro Glu Gln
1570 1575 1580

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1891 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Met Ser Pro Ser Met Asp Glu Val Leu Gly Ala Leu Arg Thr Ser Val
1 5 10 15

Lys Glu Thr Glu Arg Leu Arg Arg His Asn Arg Glu Leu Leu Ala Gly
20 25 30

Ala His Glu Pro Val Ala Ile Val Gly Met Ala Cys Arg Tyr Pro Gly
35 40 45

Gly Val Ser Thr Pro Asp Asp Leu Trp Glu Leu Ala Ala Asp Gly Val
50 55 60

Asp Ala Ile Thr Pro Phe Pro Ala Asp Arg Gly Trp Asp Glu Asp Ala
65 70 75 80

Val Tyr Ser Pro Asp Pro Asp Thr Pro Gly Thr Thr Tyr Cys Arg Glu
85 90 95

Gly Gly Phe Leu Thr Gly Ala Gly Asp Phe Asp Ala Ala Phe Phe Gly
100 105 110

Ile Ser Pro Asn Glu Ala Leu Val Met Asp Pro Gln Gln Arg Leu Leu
115 120 125

Leu Glu Thr Ser Trp Glu Thr Leu Glu Arg Ala Gly Ile Val Pro Ala
130 135 140

Ser Leu Arg Gly Ser Arg Thr Gly Val Phe Val Gly Ala Ala His Thr
145 150 155 160

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Gly Tyr Val Thr Asp Thr Ala Arg Ala Pro Glu Gly Thr Glu Gly Tyr
                165                 170                 175

Leu Leu Thr Gly Asn Ala Asp Ala Val Met Ser Gly Arg Ile Ala Tyr
            180                 185                 190

Ser Leu Gly Leu Glu Gly Pro Ala Leu Thr Ile Gly Thr Ala Cys Ser
        195                 200                 205

Ser Ser Leu Val Ala Leu His Leu Ala Val Gln Ser Leu Arg Arg Gly
    210                 215                 220

Glu Cys Asp Leu Ala Leu Ala Gly Gly Val Ala Val Met Pro Asp Pro
225                 230                 235                 240

Thr Val Phe Val Glu Phe Ser Arg Gln Arg Gly Leu Ala Val Asp Gly
                245                 250                 255

Arg Cys Lys Ala Phe Ala Glu Gly Ala Asp Gly Thr Ala Trp Ala Glu
            260                 265                 270
Gly Val Gly Val Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn
        275                 280                 285

Gly His Arg Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp
    290                 295                 300

Gly Ala Ser Asn Gly Leu Thr Ala Pro Ser Gly Pro Ala Gln Gln Arg
305                 310                 315                 320

Val Ile Arg Glu Ala Leu Ala Asp Ala Gly Leu Thr Pro Ala Asp Val
                325                 330                 335

Asp Val Val Glu Ala His Gly Thr Gly Thr Ala Leu Gly Asp Pro Ile
            340                 345                 350

Glu Ala Gly Ala Leu Leu Ala Thr Tyr Gly Arg Glu Arg Val Gly Asp
        355                 360                 365

Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Ile Gly His Ala Gln Ala
    370                 375                 380

Ala Ala Gly Val Gly Gly Val Ile Lys Val Val Gln Ala Met Arg His
385                 390                 395                 400

Gly Ser Leu Pro Arg Thr Leu His Val Asp Ala Pro Ser Ser Lys Val
                405                 410                 415

Glu Trp Ala Ser Gly Ala Val Glu Leu Leu Thr Glu Gly Arg Ser Trp
            420                 425                 430

Pro Arg Arg Val Glu Arg Val Arg Arg Ala Ala Val Ser Ala Phe Gly
        435                 440                 445

Val Ser Gly Thr Asn Ala His Val Val Leu Glu Glu Ala Pro Val Glu
    450                 455                 460

Ala Gly Ser Glu His Gly Asp Gly Pro Gly Pro Asp Arg Pro Asp Ala
465                 470                 475                 480

Val Thr Gly Pro Leu Pro Trp Val Leu Ser Ala Arg Ser Arg Glu Ala
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485 490 495

Leu Arg Gly Gln Ala Gly Arg Leu Ala Ala Leu Ala Arg Gln Gly Arg
500 505 510

Thr Glu Gly Thr Gly Gly Gly Ser Gly Leu Val Val Pro Ala Ala Asp
515 520 525

Ile Gly Tyr Ser Leu Ala Thr Thr Arg Glu Thr Leu Glu His Arg Ala
530 535 540

Val Ala Leu Val Gln Glu Asn Arg Thr Ala Gly Glu Asp Leu Ala Ala
545 550 555 560

Leu Ala Ala Gly Arg Thr Pro Glu Ser Val Val Thr Gly Val Ala Arg
565 570 575

Arg Gly Arg Gly Ile Ala Phe Leu Cys Ser Gly Gln Gly Ala Gln Arg
580 585 590

Leu Gly Ala Gly Arg Glu Leu Arg Gly Arg Phe Pro Val Phe Ala Asp
595 600 605

Ala Leu Asp Glu Ile Ala Ala Glu Phe Asp Ala His Leu Glu Arg Pro
610 615 620

Leu Leu Ser Val Met Phe Ala Glu Pro Ala Thr Pro Asp Ala Ala Leu
625 630 635 640

Leu Asp Arg Thr Asp Tyr Thr Gln Pro Ala Leu Phe Ala Val Glu Thr
645 650 655

Ala Leu Phe Arg Leu Leu Glu Ser Trp Gly Leu Val Pro Asp Val Leu
660 665 670

Val Gly His Ser Ile Gly Gly Leu Val Ala Ala His Val Ala Gly Val
675 680 685

Phe Ser Ala Ala Asp Ala Ala Arg Leu Val Ser Ala Arg Gly Arg Leu
690 695 700

Met Arg Ala Leu Pro Glu Gly Gly Ala Met Ala Ala Val Gln Ala Thr
705 710 715 720

Glu Arg Glu Ala Ala Ala Leu Glu Pro Val Ala Ala Gly Gly Ala Val
725 730 735

Val Ala Ala Val Asn Gly Pro Gln Ala Leu Val Leu Ser Gly Asp Glu
740 745 750

Ala Ala Val Leu Ala Ala Ala Gly Glu Leu Ala Ala Arg Gly Arg Arg
755 760 765

Thr Lys Arg Leu Arg Val Ser His Ala Phe His Ser Pro Arg Met Asp
770 775 780

Ala Met Leu Ala Asp Phe Arg Ala Val Ala Asp Thr Val Asp Tyr His
785 790 795 800

Ala Pro Arg Leu Pro Val Val Ser Glu Val Thr Gly Asp Leu Ala Asp
805 810 815

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Ala Ala Gln Leu Thr Asp Pro Gly Tyr Trp Thr Arg Gln Val Arg Gln
            820                 825                 830

Pro Val Arg Phe Ala Asp Ala Val Arg Thr Ala Ser Ala Arg Asp Ala
        835                 840                 845

Ala Thr Phe Ile Glu Leu Gly Pro Asp Ala Val Leu Cys Gly Met Ala
    850                 855                 860

Glu Glu Ser Leu Ala Ala Glu Ala Asp Val Val Phe Ala Pro Ala Leu
865                 870                 875                 880

Arg Arg Gly Arg Pro Glu Gly Asp Thr Val Leu Arg Ala Ala Ala Ser
                885                 890                 895

Ala Tyr Val Arg Gly Ala Gly Leu Asp Trp Ala Ala Leu Tyr Gly Gly
            900                 905                 910

Thr Gly Ala Arg Arg Thr Asp Leu Pro Thr Tyr Ala Phe Gln His Ser
        915                 920                 925

Arg Tyr Trp Leu Ala Pro Ala Ser Ala Ala Val Ala Pro Ala Thr Ala
    930                 935                 940

Ala Pro Ser Val Arg Ser Val Pro Glu Ala Glu Gln Asp Gly Ala Leu
945                 950                 955                 960

Trp Ala Ala Val His Ala Gly Asp Val Ala Ser Ala Ala Ala Arg Leu
                965                 970                 975
Gly Ala Asp Asp Ala Gly Ile Glu His Glu Leu Arg Ala Val Leu Pro
            980                 985                 990

His Leu Ala Ala Trp His Asp Arg Asp Arg Ala Thr Ala Arg Thr Ala
        995                 1000                1005

Gly Leu His Tyr Arg Val Thr Trp Gln Ala Ile Glu Ala Asp Ala Val
    1010                1015                1020

Arg Phe Ser Pro Ser Asp Arg Trp Leu Met Val Glu His Gly Gln His
1025                1030                1035                1040

Thr Glu Cys Ala Asp Ala Ala Glu Arg Ala Leu Arg Ala Ala Gly Ala
                1045                1050                1055

Glu Val Thr Arg Leu Val Trp Pro Leu Glu Gln His Thr Gly Ser Pro
            1060                1065                1070

Arg Thr Glu Thr Pro Asp Arg Gly Thr Leu Ala Ala Arg Leu Ala Glu
        1075                1080                1085

Leu Ala Arg Ser Pro Glu Gly Leu Ala Gly Val Leu Leu Leu Pro Asp
    1090                1095                1100

Ser Gly Gly Ala Ala Val Ala Gly His Pro Gly Leu Asp Gln Gly Thr
1105                1110                1115                1120

Ala Ala Val Leu Leu Thr Ile Gln Ala Leu Thr Asp Ala Ala Val Arg
                1125                1130                1135
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Ala Pro Leu Trp Val Val Thr Arg Gly Ala Val Ala Val Gly Ser Gly
1140 1145 1150

Glu Val Pro Cys Ala Val Gly Ala Arg Val Trp Gly Leu Gly Arg Val
1155 1160 1165

Ala Ala Leu Glu Val Pro Val Gln Trp Gly Gly Leu Val Asp Val Ala
1170 1175 1180

Val Gly Ala Gly Val Arg Glu Trp Arg Arg Val Val Gly Val Val Ala
1185 1190 1195 1200

Gly Gly Gly Glu Asp Gln Val Ala Val Arg Gly Gly Gly Val Phe Gly
1205 1210 1215

Arg Arg Leu Val Gly Val Gly Val Arg Gly Gly Ser Gly Val Trp Arg
1220 1225 1230

Ala Arg Gly Cys Val Val Val Thr Gly Gly Leu Gly Gly Val Gly Gly
1235 1240 1245

His Val Ala Arg Trp Leu Ala Arg Ser Gly Ala Glu His Val Val Leu
1250 1255 1260

Ala Gly Arg Arg Gly Gly Gly Val Val Gly Ala Val Glu Leu Glu Arg
1265 1270 1275 1280

Glu Leu Val Gly Leu Gly Ala Lys Val Thr Phe Val Ser Cys Asp Val
1285 1290 1295

Gly Asp Arg Ala Ser Val Val Gly Leu Leu Gly Val Val Glu Gly Leu
1300 1305 1310

Gly Val Pro Leu Arg Gly Val Phe His Ala Ala Gly Val Ala Gln Val
1315 1320 1325

Ser Gly Leu Gly Glu Val Ser Leu Ala Glu Ala Gly Gly Val Leu Gly
1330 1335 1340

Gly Lys Ala Val Gly Ala Glu Leu Leu Asp Glu Leu Thr Ala Gly Val
1345 1350 1355 1360

Glu Leu Asp Ala Phe Val Leu Phe Ser Ser Gly Ala Gly Val Trp Gly
1365 1370 1375

Ser Gly Gly Gln Ser Val Tyr Ala Ala Ala Asn Ala His Leu Asp Ala
1380 1385 1390

Leu Ala Glu Arg Arg Arg Ala Gln Gly Arg Pro Ala Thr Ser Val Ala
1395 1400 1405

Trp Gly Pro Trp Asp Gly Asp Gly Met Gly Glu Met Ala Pro Glu Gly
1410 1415 1420

Tyr Phe Ala Arg His Gly Val Ala Pro Leu His Pro Glu Thr Ala Leu
1425 1430 1435 1440

Thr Ala Leu His Gln Ala Ile Asp Gly Gly Glu Ala Thr Val Thr Val
1445 1450 1455

Ala Asp Ile Asp Trp Glu Arg Phe Ala Pro Gly Phe Thr Ala Phe Arg

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                1460                1465                1470

Pro Ser Pro Leu Ile Ala Gly Ile Pro Ala Ala Arg Thr Ala Pro Ala
        1475                1480                1485

Ala Gly Arg Pro Ala Glu Asp Thr Pro Thr Ala Pro Gly Leu Leu Arg
    1490                1495                1500

Ala Arg Pro Glu Asp Arg Pro Arg Leu Ala Leu Asp Leu Val Leu Arg
1505                1510                1515                1520

His Val Ala Ala Val Leu Gly His Ser Glu Asp Ala Arg Val Asp Ala
                1525                1530                1535

Arg Ala Pro Phe Arg Asp Leu Gly Phe Asp Ser Leu Ala Ala Val Arg
            1540                1545                1550

Leu Arg Arg Arg Leu Ala Glu Asp Thr Gly Leu Asp Leu Pro Gly Thr
        1555                1560                1565

Leu Val Phe Asp His Glu Asp Pro Thr Ala Leu Ala His His Leu Ala
    1570                1575                1580

Gly Leu Ala Asp Ala Gly Thr Pro Gly Pro Gln Glu Gly Thr Ala Arg
1585                1590                1595                1600

Ala Glu Ser Gly Leu Phe Ala Ser Phe Arg Ala Ala Val Glu Gln Arg
                1605                1610                1615

Arg Ser Ser Glu Val Val Glu Leu Met Ala Asp Leu Ala Ala Phe Arg
            1620                1625                1630

Pro Ala Tyr Ser Arg Gln His Pro Gly Ser Gly Arg Pro Ala Pro Val
        1635                1640                1645

Pro Leu Ala Thr Gly Pro Ala Thr Arg Pro Thr Leu Tyr Cys Cys Ala
    1650                1655                1660

Gly Thr Ala Val Gly Ser Gly Pro Ala Glu Tyr Val Pro Phe Ala Glu
1665                1670                1675                1680
Gly Leu Arg Gly Val Arg Glu Thr Val Ala Leu Pro Leu Ser Gly Phe
                1685                1690                1695

Gly Asp Pro Ala Glu Pro Met Pro Ala Ser Leu Asp Ala Leu Ile Glu
            1700                1705                1710

Val Gln Ala Asp Val Leu Leu Glu His Thr Ala Gly Lys Pro Phe Ala
        1715                1720                1725

Leu Ala Gly His Ser Ala Gly Ala Asn Ile Ala His Ala Leu Ala Ala
    1730                1735                1740

Arg Leu Glu Glu Arg Gly Ser Gly Pro Ala Ala Val Val Leu Met Asp
1745                1750                1755                1760

Val Tyr Arg Pro Glu Asp Pro Gly Ala Met Gly Glu Trp Arg Asp Asp
                1765                1770                1775

Leu Leu Ser Trp Ala Leu Glu Arg Ser Thr Val Pro Leu Glu Asp His
            1780                1785                1790
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Arg Leu Thr Ala Met Ala Gly Tyr Gln Arg Leu Val Leu Gly Thr Arg
        1795                1800                1805

Leu Thr Ala Leu Glu Ala Pro Val Leu Leu Ala Arg Ala Ser Glu Pro
    1810                1815                1820

Leu Cys Ala Trp Pro Pro Ala Gly Gly Ala Arg Gly Asp Trp Arg Ser
1825                1830                1835                1840

Gln Val Pro Phe Ala Arg Thr Val Ala Asp Val Pro Gly Asn His Phe
                1845                1850                1855

Thr Met Leu Thr Glu His Ala Arg His Thr Ala Ser Leu Val His Glu
            1860                1865                1870

Trp Leu Asp Ser Leu Pro His Gln Pro Gly Pro Ala Pro Leu Thr Gly
        1875                1880                1885

Gly Lys His
    1890
```

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 13987 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 350..13987

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

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GACCGCTCGG GGAGACCTGA CATATTCGTC GCGAAGTGGT TGTCCGCGCC GCGAGGTACT      60

GAAATCTTCT CCGCTCGCCC AGGACTCCGC GTGCAGGTCA CCGGAGTGCG CGACCGGCCG     120

GGACGTCGGA GCGCCGACCC TGCGGACCTG GTGCGATGCC GTGTGGTCCC GCATGATCCC     180

GCGCCGTCTC CGGTGACGAG AATCGGTGGA CAATCTCCGA ACTTGACACA ATTGATTGTC     240

GTTCACCGGC CGTTCCTGTC GCCCGGCAGT TCGCCCGCTG TACGCTCGGG AAGATCAAGA     300

AAAGGCAGAA AAGCCACGGC GTGGTACGGC GAACATATGA GGGATGCAG GTG TCT         355
                                                      Met Ser
                                                        1

GGA GAA CTC GCG ATT TCC CGC AGT GAC GAC CGG TCC GAC GCC GTT GCC       403
Gly Glu Leu Ala Ile Ser Arg Ser Asp Asp Arg Ser Asp Ala Val Ala
  5                  10                  15

GTG GTC GGA ATG GCG TGC CGG TTT CCC GGC GCC CCG GGA ATT GCC GAA      451
Val Val Gly Met Ala Cys Arg Phe Pro Gly Ala Pro Gly Ile Ala Glu
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      20                  25                  30

TTC TGG GAA CTG CTG CGC AGC GGA CGC GGT ATG CCC ACC CGT CAG GAC      499
Phe Trp Glu Leu Leu Arg Ser Gly Arg Gly Met Pro Thr Arg Gln Asp
 35                  40                  45                  50

GAC GGC ACC TGG CGG GCC GCC CTG GAG GAC CAC GCC GGC TTC GAC GCC      547
Asp Gly Thr Trp Arg Ala Ala Leu Glu Asp His Ala Gly Phe Asp Ala
                 55                  60                  65

GGG TTC TTC GGC ATG AAC GCC CGG CAG GCC GCC GCC ACC GAC CCG CAG      595
Gly Phe Phe Gly Met Asn Ala Arg Gln Ala Ala Ala Thr Asp Pro Gln
             70                  75                  80

CAC CGA CTG ATG CTG GAA CTC GGA TGG GAG GCA CTG GAG GAC GCG GGC      643
His Arg Leu Met Leu Glu Leu Gly Trp Glu Ala Leu Glu Asp Ala Gly
         85                  90                  95

ATC GTC CCC GGC GAT CTC ACC GGC ACC GAC ACC GGA GTC TTC GCC GGC      691
Ile Val Pro Gly Asp Leu Thr Gly Thr Asp Thr Gly Val Phe Ala Gly
    100                 105                 110

GTG GCG TCC GAC GAC TAT GCC GTT CTC ACC CGC CGT TCC GCC GTC TCC      739
Val Ala Ser Asp Asp Tyr Ala Val Leu Thr Arg Arg Ser Ala Val Ser
115                 120                 125                 130

GCC GGG GGA TAC ACC GCC ACG GGG CTG CAC CGC GCC CTG GCC GCC AAC      787
Ala Gly Gly Tyr Thr Ala Thr Gly Leu His Arg Ala Leu Ala Ala Asn
                135                 140                 145

CGC CTC TCC CAC TTC CTG GGC CTG CGC GGC CCC AGC CTG GTC GTC GAC      835
Arg Leu Ser His Phe Leu Gly Leu Arg Gly Pro Ser Leu Val Val Asp
            150                 155                 160

TCG GCC CAG TCC GCC TCA CTG GTG GCC GTC CAG CTC GCC TGC GAG AGT      883
Ser Ala Gln Ser Ala Ser Leu Val Ala Val Gln Leu Ala Cys Glu Ser
        165                 170                 175

CTG CGC CGG GGT GAG ACG TCG CTC GCC GTC GCG GGC GGT GTC AAC CTC      931
Leu Arg Arg Gly Glu Thr Ser Leu Ala Val Ala Gly Gly Val Asn Leu
    180                 185                 190

ATC CTC ACC GAG GAG AGC ACC ACC GTC ATG GAG CGT ATG GGA GCG CTC      979
Ile Leu Thr Glu Glu Ser Thr Thr Val Met Glu Arg Met Gly Ala Leu
195                 200                 205                 210

TCA CCC GAC GGC CGC TGC CAC ACC TTC GAC GCC CGC GCC AAC GGC TAC     1027
Ser Pro Asp Gly Arg Cys His Thr Phe Asp Ala Arg Ala Asn Gly Tyr
                215                 220                 225

GTA CGC GGC GAG GGC GGC GGA GCC GTC GTG CTC AAG CCA CTG GAC GCC     1075
Val Arg Gly Glu Gly Gly Gly Ala Val Val Leu Lys Pro Leu Asp Ala
            230                 235                 240

GCA CTC GCC GAC GGC GAC CGC GTG TAC TGC GTC ATC AAG GGA GGT GCC     1123
Ala Leu Ala Asp Gly Asp Arg Val Tyr Cys Val Ile Lys Gly Gly Ala
        245                 250                 255

GTC AAC AAC GAC GGC GGC GGC GCG AGC CTC ACC ACT CCC GAC CGG GAG     1171
Val Asn Asn Asp Gly Gly Gly Ala Ser Leu Thr Thr Pro Asp Arg Glu
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    260                 265                 270

GCG CAG GAA GCT GTG CTG CGC CAG GCC TAC CGG CGG GCG GGC GTC AGC      1219
Ala Gln Glu Ala Val Leu Arg Gln Ala Tyr Arg Arg Ala Gly Val Ser
275                 280                 285                 290

ACC GGC GCC GTC CGC TAC GTC GAG CTG CAC GGG ACC GGC ACC CGG GCC      1267
Thr Gly Ala Val Arg Tyr Val Glu Leu His Gly Thr Gly Thr Arg Ala
                295                 300                 305

GGC GAC CCC GTC GAG GCG GCC GCA CTG GGC GCC GTG CTC GGG GCG GGG      1315
Gly Asp Pro Val Glu Ala Ala Ala Leu Gly Ala Val Leu Gly Ala Gly
            310                 315                 320

GCG GAC AGC GGC CGC AGC ACG CCG CTC GCC GTC GGC TCG GTG AAG ACC      1363
Ala Asp Ser Gly Arg Ser Thr Pro Leu Ala Val Gly Ser Val Lys Thr
        325                 330                 335

AAC GTC GGC CAT CTG GAG GGC GCG GCG GGC ATC GTC GGA CTG ATC AAG      1411
Asn Val Gly His Leu Glu Gly Ala Ala Gly Ile Val Gly Leu Ile Lys
    340                 345                 350

GCC ACG CTG TGC GTA CGG AAG GGC GAA CTC GTC CCC AGC CTC AAC TTC      1459
Ala Thr Leu Cys Val Arg Lys Gly Glu Leu Val Pro Ser Leu Asn Phe
355                 360                 365                 370

AGC ACG CCG AAC CCT GAC ATC CCC CTC GAC GAC CTG CGG CTG CGC GTC      1507
Ser Thr Pro Asn Pro Asp Ile Pro Leu Asp Asp Leu Arg Leu Arg Val
                375                 380                 385

CAG ACC GAA CGG CAG GAG TGG AAC GAG GAG GAC GAC CGG CCG CGC GTG      1555
Gln Thr Glu Arg Gln Glu Trp Asn Glu Glu Asp Asp Arg Pro Arg Val
            390                 395                 400

GCC GGC GTC TCC TCC TTC GGT ATG GGC GGA ACC AAT GTC CAC CTC GTG      1603
Ala Gly Val Ser Ser Phe Gly Met Gly Gly Thr Asn Val His Leu Val
        405                 410                 415

ATC GCG GAG GCT CCG GCC GCG GCG GGG TCC TCC GGG GCG GGG GGT TCG      1651
Ile Ala Glu Ala Pro Ala Ala Ala Gly Ser Ser Gly Ala Gly Gly Ser
    420                 425                 430

GGC GCT GGT TCC GGT GCC GGT ATC AGC GCT GTT TCT GGT GTG GTG CCG      1699
Gly Ala Gly Ser Gly Ala Gly Ile Ser Ala Val Ser Gly Val Val Pro
435                 440                 445                 450

GTG GTG GTT TCG GGG CGT TCG CGG GTG GTG GTG CGG GAG GCT GCG GGC      1747
Val Val Val Ser Gly Arg Ser Arg Val Val Val Arg Glu Ala Ala Gly
                455                 460                 465

CGG TTG GCG GAG GTG GTG GAG GCC GGT GGT GTG GGG CTG GCG GAT GTG      1795
Arg Leu Ala Glu Val Val Glu Ala Gly Gly Val Gly Leu Ala Asp Val
            470                 475                 480

GCG GTG ACG ATG GCG GAC CGG TCG CGG TTT GGG TAT CGG GCG GTT GTG      1843
Ala Val Thr Met Ala Asp Arg Ser Arg Phe Gly Tyr Arg Ala Val Val
        485                 490                 495

CTG GCT CGG GGT GAG GCT GAG CTT GCC GGG CGT TTG CGG GCG TTG GCG      1891
Leu Ala Arg Gly Glu Ala Glu Leu Ala Gly Arg Leu Arg Ala Leu Ala
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    500                 505                 510

GGG GGT GAT CCG GAC GCG GGT GTG GTC ACC GGT GCG GTT CTC GAC GGT      1939
Gly Gly Asp Pro Asp Ala Gly Val Val Thr Gly Ala Val Leu Asp Gly
515                 520                 525                 530

GGT GTG GTT GTC GGT GCT GCC CCC GGC GGT GCC GGT GCT GCC GGT GGT      1987
Gly Val Val Val Gly Ala Ala Pro Gly Gly Ala Gly Ala Ala Gly Gly
                535                 540                 545

GCC GGT GCT GCC GGT GGT GCC GGT GGT GGG GGC GTG GTG TTG GTT TTC      2035
Ala Gly Ala Ala Gly Gly Ala Gly Gly Gly Gly Val Val Leu Val Phe
            550                 555                 560

CCT GGT CAG GGG ACG CAG TGG GTG GGG ATG GGT GCG GGG CTG CTG GGG      2083
Pro Gly Gln Gly Thr Gln Trp Val Gly Met Gly Ala Gly Leu Leu Gly
        565                 570                 575

TCT TCG GAG GTG TTT GCG GCG TCG ATG CGG GAG TGT GCG CGG GCG CTG      2131
Ser Ser Glu Val Phe Ala Ala Ser Met Arg Glu Cys Ala Arg Ala Leu
    580                 585                 590

AGT GTT CAT GTG GGG TGG GAT TTG CTG GAG GTG GTG TCG GGC GGG GCC      2179
Ser Val His Val Gly Trp Asp Leu Leu Glu Val Val Ser Gly Gly Ala
595                 600                 605                 610

GGG TTG GAG CGG GTG GAT GTG GTG CAG CCG GTG ACG TGG GCG GTG ATG      2227
Gly Leu Glu Arg Val Asp Val Val Gln Pro Val Thr Trp Ala Val Met
                615                 620                 625

GTG TCG CTG GCC CGG TAC TGG CAG GCG ATG GGT GTG GAC GTG GCT GCG      2275
Val Ser Leu Ala Arg Tyr Trp Gln Ala Met Gly Val Asp Val Ala Ala
            630                 635                 640

GTG GTG GGT CAT TCC CAG GGG GAG ATC GCC GCT GCC ACG GTG GCG GGG      2323
Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Ala Thr Val Ala Gly
        645                 650                 655

GCG TTG TCG CTG GAG GAT GCG GCG GCT GTG GTC GCT CTG CGG GCG GGG      2371
Ala Leu Ser Leu Glu Asp Ala Ala Ala Val Val Ala Leu Arg Ala Gly
    660                 665                 670

TTG ATT GGC CGG TAT CTG GCG GGT CGT GGT GCG ATG GCG GCT GTT CCG      2419
Leu Ile Gly Arg Tyr Leu Ala Gly Arg Gly Ala Met Ala Ala Val Pro
675                 680                 685                 690

CTG CCT GCC GGC GAG GTC GAG GCC GGG CTG GCG AAG TGG CCG GGT GTG      2467
Leu Pro Ala Gly Glu Val Glu Ala Gly Leu Ala Lys Trp Pro Gly Val
                695                 700                 705

GAG GTC GCG GCG GTC AAC GGT CCG GCG TCT ACG GTG GTT TCC GGG GAT      2515
Glu Val Ala Ala Val Asn Gly Pro Ala Ser Thr Val Val Ser Gly Asp
            710                 715                 720

CGG CGG GCG GTG GCC GGT TAT GTG GCC GTC TGT CAG GCG GAG GGT GTG      2563
Arg Arg Ala Val Ala Gly Tyr Val Ala Val Cys Gln Ala Glu Gly Val
        725                 730                 735

CAG GCC CGG TTG ATA CCG GTG GAC TAC GCC TCT CAC TCC CGC CAT GTG      2611
Gln Ala Arg Leu Ile Pro Val Asp Tyr Ala Ser His Ser Arg His Val
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    740                 745                 750

GAG GAC CTG AAG GGC GAG TTG GAG CGG GTG CTG TCC GGT ATC CGC CCC      2659
Glu Asp Leu Lys Gly Glu Leu Glu Arg Val Leu Ser Gly Ile Arg Pro
755                 760                 765                 770

CGC AGT CCG CGG GTG CCG GTG TGT TCC ACC GTC GCC GGA GAG CAG CCG      2707
Arg Ser Pro Arg Val Pro Val Cys Ser Thr Val Ala Gly Glu Gln Pro
                775                 780                 785

GGC GAG CCG GTT TTC GAT GCG GGG TAT TGG TTC CGT AAT CTG CGG AAC      2755
Gly Glu Pro Val Phe Asp Ala Gly Tyr Trp Phe Arg Asn Leu Arg Asn
            790                 795                 800

CGG GTT GAG TTC TCC GCG GTG GTC GGT GGT TTG TTG GAG GAG GGC CAC      2803
Arg Val Glu Phe Ser Ala Val Val Gly Gly Leu Leu Glu Glu Gly His
        805                 810                 815

CGT CGG TTC ATC GAG GTC AGT GCC CAC CCG GTA CTC GTC CAT GCG ATC      2851
Arg Arg Phe Ile Glu Val Ser Ala His Pro Val Leu Val His Ala Ile
    820                 825                 830

GAG CAG ACG GCC GAG GCC GCG GAC CGG AGT GTC CAT GCC ACC GGG ACC      2899
Glu Gln Thr Ala Glu Ala Ala Asp Arg Ser Val His Ala Thr Gly Thr
835                 840                 845                 850

CTG CGC CGC CAG GAC GAC AGC CCG CAC CGC CTG CTG ACC TCC ACC GCC      2947
Leu Arg Arg Gln Asp Asp Ser Pro His Arg Leu Leu Thr Ser Thr Ala
                855                 860                 865

GAG GCC TGG GCC CAC GGC GCC ACC CTC ACC TGG GAC CCC GCC CTG CCC      2995
Glu Ala Trp Ala His Gly Ala Thr Leu Thr Trp Asp Pro Ala Leu Pro
            870                 875                 880

CCA GGC CAC CTC ACC ACC CTC CCC ACC TAC CCC TTC AAC CAC CAC CAC      3043
Pro Gly His Leu Thr Thr Leu Pro Thr Tyr Pro Phe Asn His His His
        885                 890                 895

TAC TGG CTC GAC ACC ATT GAC GGG GGC GGA GGG GAC GAC GCG ACC CAG      3091
Tyr Trp Leu Asp Thr Ile Asp Gly Gly Gly Gly Asp Asp Ala Thr Gln
    900                 905                 910

GAG AAG GAG AGC GGC CCT CTG ACG CGG GAA CTG CGT GGG CTG CCG TCC      3139
Glu Lys Glu Ser Gly Pro Leu Thr Arg Glu Leu Arg Gly Leu Pro Ser
915                 920                 925                 930

TCT CAG AAG CAA CTG GGT TTC CTG CTC GAT CTG GTG TGC CGG CAC ACG      3187
Ser Gln Lys Gln Leu Gly Phe Leu Leu Asp Leu Val Cys Arg His Thr
                935                 940                 945

GCC GTC GTA CTC GGC CTG GAC ACG GCC GCC GAG GTG GAC CCG GAC CTG      3235
Ala Val Val Leu Gly Leu Asp Thr Ala Ala Glu Val Asp Pro Asp Leu
            950                 955                 960

TCC TTC AAG AAG CAG GGC ATC CAG TCC ATG ACC GGC GTC GAG CTG CGC      3283
Ser Phe Lys Lys Gln Gly Ile Gln Ser Met Thr Gly Val Glu Leu Arg
        965                 970                 975

AAC AGG CTG CTG ACC GAG ACC GGC CTG GCA TTG CCC ACC ACC CTC GTC      3331
Asn Arg Leu Leu Thr Glu Thr Gly Leu Ala Leu Pro Thr Thr Leu Val
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    980                 985                 990

TAC GAC CGG CCC ACC CCT CGC GCC CTG GCG CAG TTC CTC CAC ACC GAG      3379
Tyr Asp Arg Pro Thr Pro Arg Ala Leu Ala Gln Phe Leu His Thr Glu
995                 1000                1005                1010

TTG CTC GAC GGC TCC CCC TCG GGC TCC GTC CTC GCA CCG GCG CAG AAG      3427
Leu Leu Asp Gly Ser Pro Ser Gly Ser Val Leu Ala Pro Ala Gln Lys
                1015                1020                1025

AGC TTC GAG GCC GGC GGG CCC GGA GTG CTC TCG TCG GCC GCG GTA GGG      3475
Ser Phe Glu Ala Gly Gly Pro Gly Val Leu Ser Ser Ala Ala Val Gly
            1030                1035                1040

GTG TCG GAC GCC CGG GGC GGC AGC CGG GAC GAC GAC GAC CCG ATC GCC      3523
Val Ser Asp Ala Arg Gly Gly Ser Arg Asp Asp Asp Asp Pro Ile Ala
        1045                1050                1055

ATC GTG GGT GTC GGC TGC CGG CTC CCC GGC GGC GTC GAC TCG CGC GCC      3571
Ile Val Gly Val Gly Cys Arg Leu Pro Gly Gly Val Asp Ser Arg Ala
    1060                1065                1070

GCT CTC TGG GAG CTG CTG GAG TCC GGC GCC GAC GCC ATC TCG TCC TTC      3619
Ala Leu Trp Glu Leu Leu Glu Ser Gly Ala Asp Ala Ile Ser Ser Phe
1075                1080                1085                1090

CCC ACC GAC CGC GGC TGG GAC CTC GAC GGG CTG TAC GAC CCC GAG CCC      3667
Pro Thr Asp Arg Gly Trp Asp Leu Asp Gly Leu Tyr Asp Pro Glu Pro
                1095                1100                1105

GGG ACG CCC GGC AAG ACC TAT GTG CGG GAG GGC GGG TTC CTG CAC TCG      3715
Gly Thr Pro Gly Lys Thr Tyr Val Arg Glu Gly Gly Phe Leu His Ser
            1110                1115                1120

GCG GCC GAG TTC GAC GCG GAG TTC TTC GGG ATA TCG CCG CGC GAG GCC      3763
Ala Ala Glu Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg Glu Ala
        1125                1130                1135

ACG GCC ATG GAC CCG CAG CAG CGC TTG CTG CTG GAA GCG TCG TGG GAG      3811
Thr Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Ala Ser Trp Glu
    1140                1145                1150

GCC CTC GAG GAC GCC GGA GTG CTC CCC GAG TCA CTG CGC GGC GGC GAC      3859
Ala Leu Glu Asp Ala Gly Val Leu Pro Glu Ser Leu Arg Gly Gly Asp
1155                1160                1165                1170

GCC GGA GTG TTC GTC GGC GCC ACC GCA CCG GAG TAC GGG CCG AGG CTT      3907
Ala Gly Val Phe Val Gly Ala Thr Ala Pro Glu Tyr Gly Pro Arg Leu
                1175                1180                1185

CAC GAG GGA GCG GAC GGA TAC GAG GGG TAC CTG CTC ACC GGC ACC ACC      3955
His Glu Gly Ala Asp Gly Tyr Glu Gly Tyr Leu Leu Thr Gly Thr Thr
            1190                1195                1200

GCG AGC GTG GCC TCC GGC CGG ATC GCC TAC ACC CTC GGC ACC GGC GGA      4003
Ala Ser Val Ala Ser Gly Arg Ile Ala Tyr Thr Leu Gly Thr Gly Gly
        1205                1210                1215

CCG GCG CTC ACC GTC GAC ACC GCG TGC TCC TCG TCC CTG GTG GCG CTG      4051
Pro Ala Leu Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu
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     1220                1225                1230

CAC CTG GCC GTG CAG GCG CTG CGC CGG GGC GAG TGC GGG CTG GCT CTG      4099
His Leu Ala Val Gln Ala Leu Arg Arg Gly Glu Cys Gly Leu Ala Leu
1235                1240                1245                1250

GCG GGC GGC GCC ACG GTG ATG TCG GGG CCC GGC ATG TTC GTG GAG TTC      4147
Ala Gly Gly Ala Thr Val Met Ser Gly Pro Gly Met Phe Val Glu Phe
                1255                1260                1265

TCG CGG CAG CGC GGG CTC GCC CCC GAC GGC CGC TGC ATG CCG TTC TCC      4195
Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Met Pro Phe Ser
            1270                1275                1280

GCC GAT GCC GAC GGT ACG GCC TGG TCC GAG GGT GTC GCC GTA CTG GCA      4243
Ala Asp Ala Asp Gly Thr Ala Trp Ser Glu Gly Val Ala Val Leu Ala
        1285                1290                1295

CTG GAG CGG CTC TCC GAC GCC CGG CGT GCG GGA CAC CGG GTG CTG GGC      4291
Leu Glu Arg Leu Ser Asp Ala Arg Arg Ala Gly His Arg Val Leu Gly
    1300                1305                1310

GTG GTG CGG GGC AGT GCG GTC AAC CAG GAC GGT GCC AGC AAC GGC CTG      4339
Val Val Arg Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu
1315                1320                1325                1330

ACC GCT CCC AAC CGC TCC GCG CAG GAG GGC GTC ATC CGA GCT GCC CTG      4387
Thr Ala Pro Asn Arg Ser Ala Gln Glu Gly Val Ile Arg Ala Ala Leu
                1335                1340                1345

GCC GAC GCC GGC CTC GCG CCG GGT GAC GTG GAC GCG GTG GAG GCG CAC      4435
Ala Asp Ala Gly Leu Ala Pro Gly Asp Val Asp Ala Val Glu Ala His
            1350                1355                1360

GGT ACG GGG ACG GCG CTG GGC GAT CCG ATC GAG GCG AGC GCG CTG CTG      4483
Gly Thr Gly Thr Ala Leu Gly Asp Pro Ile Glu Ala Ser Ala Leu Leu
        1365                1370                1375

GCC ACG TAC GGG CGT GAG CGG GTG GGC GAC CCC TTG TGG CTC GGG TCG      4531
Ala Thr Tyr Gly Arg Glu Arg Val Gly Asp Pro Leu Trp Leu Gly Ser
    1380                1385                1390

CTG AAG TCC AAC GTC GGT CAC ACC CAG GCC GCC GCG GGG GCC GCG GGT      4579
Leu Lys Ser Asn Val Gly His Thr Gln Ala Ala Ala Gly Ala Ala Gly
1395                1400                1405                1410

GTG GTC AAG ATG CTG CTT GCC CTG GAG CAC GGC ACG CTG CCG CGG ACA      4627
Val Val Lys Met Leu Leu Ala Leu Glu His Gly Thr Leu Pro Arg Thr
                1415                1420                1425

CTT CAC GCG GAC CGG CCC AGC ACG CAC GTC GAC TGG TCG TCG GGC ACC      4675
Leu His Ala Asp Arg Pro Ser Thr His Val Asp Trp Ser Ser Gly Thr
            1430                1435                1440

GTC GCC CTG CTG GCA GAG GCG CGC CGG TGG CCC CGG CGG TCG GAC CGC      4723
Val Ala Leu Leu Ala Glu Ala Arg Arg Trp Pro Arg Arg Ser Asp Arg
        1445                1450                1455

CCG CGC CGG GCG GCT GTG TCG TCG TTC GGG ATC AGT GGG ACG AAC GCG      4771
Pro Arg Arg Ala Ala Val Ser Ser Phe Gly Ile Ser Gly Thr Asn Ala
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     1460                1465                1470

CAT CTG ATC ATC GAG GAG GCG CCG GAG TGG GTC GAG GAC ATC GAC GGC      4819
His Leu Ile Ile Glu Glu Ala Pro Glu Trp Val Glu Asp Ile Asp Gly
1475                1480                1485                1490

GTC GCT GCT CCT GAC CGC GGT ACC GCG GAC GCG GCT GCT CCG TCG CCG      4867
Val Ala Ala Pro Asp Arg Gly Thr Ala Asp Ala Ala Ala Pro Ser Pro
                1495                1500                1505

CTG TTG TTG TCC GCG CGG TCG GAG GGG GCG TTG CGG GCG CAG GCG GTG      4915
Leu Leu Leu Ser Ala Arg Ser Glu Gly Ala Leu Arg Ala Gln Ala Val
            1510                1515                1520

CGG TTG GGT GAG TAC GTG GAG CGG GTG GGT GCG GAT CCG CGG GAT GTG      4963
Arg Leu Gly Glu Tyr Val Glu Arg Val Gly Ala Asp Pro Arg Asp Val
        1525                1530                1535

GCT TAT TCG CTG GCT TCG ACG CGG ACT CTT TTC GAG CAC CGT GCG GTG      5011
Ala Tyr Ser Leu Ala Ser Thr Arg Thr Leu Phe Glu His Arg Ala Val
    1540                1545                1550

GTG CCG TGT GGT GGG CGT GGG GAG CTC GTC GCT GCT CTT GGT GGG TTT      5059
Val Pro Cys Gly Gly Arg Gly Glu Leu Val Ala Ala Leu Gly Gly Phe
1555                1560                1565                1570

GCT GCC GGG AGG GTG TCT GGG GGT GTG CGG TCC GGG CGG GCT GTG CCG      5107
Ala Ala Gly Arg Val Ser Gly Gly Val Arg Ser Gly Arg Ala Val Pro
                1575                1580                1585

GGT GGG GTG GGG GTG TTG TTC ACG GGT CAG GGT GCG CAG TGG GTT GGT      5155
Gly Gly Val Gly Val Leu Phe Thr Gly Gln Gly Ala Gln Trp Val Gly
            1590                1595                1600

ATG GGG CGT GGG TTG TAT GCG GGG GGT GGG GTG TTT GCG GAG GTG CTG      5203
Met Gly Arg Gly Leu Tyr Ala Gly Gly Gly Val Phe Ala Glu Val Leu
        1605                1610                1615

GAT GAG GTG TTG TCG ATG GTG GGG GAG GTG GAT GGT CGG TCG TTG CGG      5251
Asp Glu Val Leu Ser Met Val Gly Glu Val Asp Gly Arg Ser Leu Arg
    1620                1625                1630

GAT GTG ATG TTC GGC GAC GTC GAC GTG GAC GCG GGT GCC GGG GCT GAT      5299
Asp Val Met Phe Gly Asp Val Asp Val Asp Ala Gly Ala Gly Ala Asp
1635                1640                1645                1650

GCG GGT GCC GGT GCG GGT GCT GGG GTC GGT TCT GGT TCC GGT TCT GTG      5347
Ala Gly Ala Gly Ala Gly Ala Gly Val Gly Ser Gly Ser Gly Ser Val
                1655                1660                1665

GGT GGG TTG TTG GGT CGG ACG GAG TTT GCT CAG CCT GCG CTG TTT GCG      5395
Gly Gly Leu Leu Gly Arg Thr Glu Phe Ala Gln Pro Ala Leu Phe Ala
            1670                1675                1680

TTG GAG GTG GCG TTG TTC CGG GCG TTG GAG GCT CGG GGT GTG GAG GTG      5443
Leu Glu Val Ala Leu Phe Arg Ala Leu Glu Ala Arg Gly Val Glu Val
        1685                1690                1695

TCG GTG GTG TTG GGT CAT TCG GTG GGG GAG GTG GCT GCT GCG TAT GTG      5491
Ser Val Val Leu Gly His Ser Val Gly Glu Val Ala Ala Ala Tyr Val
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    1700                1705                1710

GCG GGG GTG TTG TCG TTG GGT GAT GCG GTG CGG TTG GTG GTG GCG CGG      5539
Ala Gly Val Leu Ser Leu Gly Asp Ala Val Arg Leu Val Val Ala Arg
1715                1720                1725                1730

GGT GGG TTG ATG GGT GGG TTG CCG GTG GGT GGG GGG ATG TGG TCG GTG      5587
Gly Gly Leu Met Gly Gly Leu Pro Val Gly Gly Gly Met Trp Ser Val
                1735                1740                1745

GGG GCG TCG GAG TCG GTG GTG CGG GGG GTT GTT GAG GGG TTG GGG GAG      5635
Gly Ala Ser Glu Ser Val Val Arg Gly Val Val Glu Gly Leu Gly Glu
            1750                1755                1760

TGG GTG TCG GTT GCG GCG GTG AAT GGG CCG CGG TCG GTG GTG TTG TCG      5683
Trp Val Ser Val Ala Ala Val Asn Gly Pro Arg Ser Val Val Leu Ser
        1765                1770                1775

GGT GAT GTG GGT GTG CTG GAG TCG GTG GTT GCC TCG CTG ATG GGG GAT      5731
Gly Asp Val Gly Val Leu Glu Ser Val Val Ala Ser Leu Met Gly Asp
    1780                1785                1790

GGG GTG GAG TGC CGG CGG TTG GAT GTG TCG CAT GGG TTT CAT TCG GTG      5779
Gly Val Glu Cys Arg Arg Leu Asp Val Ser His Gly Phe His Ser Val
1795                1800                1805                1810

TTG ATG GAG CCG GTG TTG GGG GAG TTC CGG GGG GTT GTG GAG TCG TTG      5827
Leu Met Glu Pro Val Leu Gly Glu Phe Arg Gly Val Val Glu Ser Leu
                1815                1820                1825

GAG TTC GGT CGG GTG CGG CCG GGT GTG GTG GTG GTG TCG GGT GTG TCG      5875
Glu Phe Gly Arg Val Arg Pro Gly Val Val Val Val Ser Gly Val Ser
            1830                1835                1840

GGT GGG GTG GTG GGT TCG GGG GAG TTG GGG GAT CCG GGG TAT TGG GTG      5923
Gly Gly Val Val Gly Ser Gly Glu Leu Gly Asp Pro Gly Tyr Trp Val
        1845                1850                1855

CGT CAT GCG CGG GAG GCG GTG CGT TTC GCG GAT GGG GTG GGG GTG GTG      5971
Arg His Ala Arg Glu Ala Val Arg Phe Ala Asp Gly Val Gly Val Val
    1860                1865                1870

CGT GGT CTG GGT GTG GGG ACG TTG GTG GAG GTG GGT CCG CAT GGG GTG      6019
Arg Gly Leu Gly Val Gly Thr Leu Val Glu Val Gly Pro His Gly Val
1875                1880                1885                1890

CTG ACG GGG ATG GCG GGT GAG TGC CTG GGG GCC GGT GAT GAT GTG GTG      6067
Leu Thr Gly Met Ala Gly Glu Cys Leu Gly Ala Gly Asp Asp Val Val
                1895                1900                1905

GTG GTG CCG GCG ATG CGG CGG GGC CGT GCG GAG CGG GAG GTG TTC GAG      6115
Val Val Pro Ala Met Arg Arg Gly Arg Ala Glu Arg Glu Val Phe Glu
            1910                1915                1920

GCG GCG CTG GCG ACG GTG TTC ACC CGG GAC GCC GGC CTG GAC GCC ACG      6163
Ala Ala Leu Ala Thr Val Phe Thr Arg Asp Ala Gly Leu Asp Ala Thr
        1925                1930                1935

GCA CTC CAC ACC GGG AGC ACC GGC CGG CGC ATC GAC CTC CCC ACC TAC      6211
Ala Leu His Thr Gly Ser Thr Gly Arg Arg Ile Asp Leu Pro Thr Tyr
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    1940                1945                1950

CCC TTC CAA CGC GAC CGC TAC TGG CTG GAC CCC GTT CGC ACC GCC GTG      6259
Pro Phe Gln Arg Asp Arg Tyr Trp Leu Asp Pro Val Arg Thr Ala Val
1955                1960                1965                1970

ACC GGC GTC GAG CCC GCC GGC TCG CCG GCG GAC GCT CGG GCC ACT GAG      6307
Thr Gly Val Glu Pro Ala Gly Ser Pro Ala Asp Ala Arg Ala Thr Glu
                1975                1980                1985

CGG GGA CGG TCG ACG ACG GCC GGG ATC CGC TAC CGC GTC GCT TGG CAG      6355
Arg Gly Arg Ser Thr Thr Ala Gly Ile Arg Tyr Arg Val Ala Trp Gln
            1990                1995                2000

CCG GCC GTC GTC GAC CGC GGC AAC CCC GGG CCT GCC GGT CAT GTG CTG      6403
Pro Ala Val Val Asp Arg Gly Asn Pro Gly Pro Ala Gly His Val Leu
        2005                2010                2015

CTT CTG GCC CCG GAC GAG GAC ACG GCC GAC TCC GGA CTC GCC CCC GCG      6451
Leu Leu Ala Pro Asp Glu Asp Thr Ala Asp Ser Gly Leu Ala Pro Ala
    2020                2025                2030

ATC GCA CGT GAA CTC GCC GTG CGC GGG GCC GAG GTC CAC ACC GTC GCC      6499
Ile Ala Arg Glu Leu Ala Val Arg Gly Ala Glu Val His Thr Val Ala
2035                2040                2045                2050

GTG CCG GTC GGT ACA GGC CGG GAG GCA GCC GGG GAC CTG TTG CGG GCC      6547
Val Pro Val Gly Thr Gly Arg Glu Ala Ala Gly Asp Leu Leu Arg Ala
                2055                2060                2065

GCC GGT GAC GGT GCC GCC CGC AGC ACC CGA GTT CTG TGG CTC GCC CCG      6595
Ala Gly Asp Gly Ala Ala Arg Ser Thr Arg Val Leu Trp Leu Ala Pro
            2070                2075                2080

GCC GAG CCG GAC GCG GCC GAC GCC GTC GCC CTC GTC CAG GCG CTG GGC      6643
Ala Glu Pro Asp Ala Ala Asp Ala Val Ala Leu Val Gln Ala Leu Gly
        2085                2090                2095

GAG GCG GTA CCC GAA GCC CCG CTC TGG ATC ACC ACC CGT GAG GCG GCG      6691
Glu Ala Val Pro Glu Ala Pro Leu Trp Ile Thr Thr Arg Glu Ala Ala
    2100                2105                2110

GCC GTG CGG CCG GAC GAG ACC CCT TCC GTC GGG GGC GCT CAG CTG TGG      6739
Ala Val Arg Pro Asp Glu Thr Pro Ser Val Gly Gly Ala Gln Leu Trp
2115                2120                2125                2130

GGA CTC GGA CAG GTC GCC GCG CTC GAA CTG GGG CGG CGC TGG GGC GGC      6787
Gly Leu Gly Gln Val Ala Ala Leu Glu Leu Gly Arg Arg Trp Gly Gly
                2135                2140                2145

TTG GCG GAC CTG CCC GGG AGT GCG TCG CCC GCG GTG CTC CGT ACG TTC      6835
Leu Ala Asp Leu Pro Gly Ser Ala Ser Pro Ala Val Leu Arg Thr Phe
            2150                2155                2160

GTC GGG GCG CTG CTC GCC GGG GGA GAG AAC CAG TTC GCG GTA CGG CCC      6883
Val Gly Ala Leu Leu Ala Gly Gly Glu Asn Gln Phe Ala Val Arg Pro
        2165                2170                2175

TCC GGC GTC CAT GTC CGC CGT GTG GTT CCC GCG CCC GTC CCC GTC CCG      6931
Ser Gly Val His Val Arg Arg Val Val Pro Ala Pro Val Pro Val Pro
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    2180                2185                2190

GCC TCC GCT CGC ACC GTC ACC ACG GCC CCC GCC ACC GCC GTC GGC GAG      6979
Ala Ser Ala Arg Thr Val Thr Thr Ala Pro Ala Thr Ala Val Gly Glu
2195                2200                2205                2210

GAC GCA CGG AAC GAC ACC TCG GAC GTG GTC GTG CCG GAC GAC CGG TGG      7027
Asp Ala Arg Asn Asp Thr Ser Asp Val Val Val Pro Asp Asp Arg Trp
                2215                2220                2225

TCC TCC GGC ACC GTA CTG ATC ACC GGG GGC ACC GGT GCC CTG GGT GCG      7075
Ser Ser Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Ala Leu Gly Ala
            2230                2235                2240

CAG GTC GCC CGC AGG CTC GCC CGG TCG GGC GCC GCG CGT CTG CTC CTG      7123
Gln Val Ala Arg Arg Leu Ala Arg Ser Gly Ala Ala Arg Leu Leu Leu
        2245                2250                2255

GTG GGC CGG CGC GGC GCG GCC GGC CCC GGA GTG GGC GAA CTC GTC GAG      7171
Val Gly Arg Arg Gly Ala Ala Gly Pro Gly Val Gly Glu Leu Val Glu
    2260                2265                2270

GAG CTG ACG GCG CTC GGT TCC GAA GTG GCC GTC GAG GCC TGC GAC GTC      7219
Glu Leu Thr Ala Leu Gly Ser Glu Val Ala Val Glu Ala Cys Asp Val
2275                2280                2285                2290

GCC GAC CGG GAC GCA CTG GCC GCG CTC CTC GCG GGC CTC CCC GAG GAG      7267
Ala Asp Arg Asp Ala Leu Ala Ala Leu Leu Ala Gly Leu Pro Glu Glu
                2295                2300                2305

CGG CCC CTC GTC GCC GTA CTG CAC GCG GCA GGT GTG CTC GAC GAC GGT      7315
Arg Pro Leu Val Ala Val Leu His Ala Ala Gly Val Leu Asp Asp Gly
            2310                2315                2320

GTG CTC GAC TCG CTC ACC TCC GAC CGG GTG GAC GCC GTA CTG CGG GAC      7363
Val Leu Asp Ser Leu Thr Ser Asp Arg Val Asp Ala Val Leu Arg Asp
        2325                2330                2335

AAG GTC ACC GCC GCC CGT CAC CTG GAC GAG CTG ACC GCG GAC CTT CCG      7411
Lys Val Thr Ala Ala Arg His Leu Asp Glu Leu Thr Ala Asp Leu Pro
    2340                2345                2350

CTC GAC GCC TTC GTG CTC TTC TCC TCC ATC GTC GGC GTG TGG GGC AAC      7459
Leu Asp Ala Phe Val Leu Phe Ser Ser Ile Val Gly Val Trp Gly Asn
2355                2360                2365                2370

GGA GGG CAG GCC GTC TAC GCG GCC GCC AAC GCC GCG CTC GAC GCC CTG      7507
Gly Gly Gln Ala Val Tyr Ala Ala Ala Asn Ala Ala Leu Asp Ala Leu
                2375                2380                2385

GCG CAG CGG CGC CGG GCC AGG GGA GCC CGT GCC GCC TCG ATC GCC TGG      7555
Ala Gln Arg Arg Arg Ala Arg Gly Ala Arg Ala Ala Ser Ile Ala Trp
            2390                2395                2400

GGG CCG TGG GCC GGT GCC GGA ATG GCC TCC GGA ACG GCG GCG AAG TCC      7603
Gly Pro Trp Ala Gly Ala Gly Met Ala Ser Gly Thr Ala Ala Lys Ser
        2405                2410                2415

TTC GAA CGG GAC GGC GTC ACG GCC CTG GAC CCC GAG CGC GCG CTC GAC      7651
Phe Glu Arg Asp Gly Val Thr Ala Leu Asp Pro Glu Arg Ala Leu Asp
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     2420                2425                2430

GTC CTC GAC GAC GTG GTG GGC GCC GGC GGG ACC TCT GCC GCA GGG ACG      7699
Val Leu Asp Asp Val Val Gly Ala Gly Gly Thr Ser Ala Ala Gly Thr
2435                2440                2445                2450

CAC GCG GCC GGC GAG AGC TCC CTG CTC GTC GCC GAC GTG GAC TGG GAG      7747
His Ala Ala Gly Glu Ser Ser Leu Leu Val Ala Asp Val Asp Trp Glu
                2455                2460                2465

ACC TTC GTC GGG CGT TCG GTC ACC CGC CGT ACC TGG TCG CTC TTC GAC      7795
Thr Phe Val Gly Arg Ser Val Thr Arg Arg Thr Trp Ser Leu Phe Asp
          2470                2475                2480

GGC GTC TCC GCC GCC CGT TCG GCG CGT GCC GGC CAT GCC GCG GAC GAC      7843
Gly Val Ser Ala Ala Arg Ser Ala Arg Ala Gly His Ala Ala Asp Asp
     2485                2490                2495

CGT GCC GCT CTC ACC CCA GGG ACG CGG CCG GGC GAC GGC GCA CCG GGC      7891
Arg Ala Ala Leu Thr Pro Gly Thr Arg Pro Gly Asp Gly Ala Pro Gly
2500                2505                2510

GGG AGC GGA CAG GAC GGG GGC GAG GGC CGG CCG TGG CTC TCC GTC GGC      7939
Gly Ser Gly Gln Asp Gly Gly Glu Gly Arg Pro Trp Leu Ser Val Gly
2515                2520                2525                2530

CCC TCG CCG GCG GAA CGC CGT CGT GCT CTG CTC ACG CTT GTG CGC TCG      7987
Pro Ser Pro Ala Glu Arg Arg Arg Ala Leu Leu Thr Leu Val Arg Ser
                2535                2540                2545

GAG GCC GCC GGG ATC CTG CGC CAC GCC TCG GCC GAC GCG GTC GAC CCG      8035
Glu Ala Ala Gly Ile Leu Arg His Ala Ser Ala Asp Ala Val Asp Pro
          2550                2555                2560

GAG CTG GCC TTC CGG TCC GCC GGG TTC GAC TCC CTC ACC GTT CTC GAA      8083
Glu Leu Ala Phe Arg Ser Ala Gly Phe Asp Ser Leu Thr Val Leu Glu
     2565                2570                2575

CTG CGT AAC CGC CTG ACC GCT GCC ACC GGC CTG AAC CTG CCG AAC ACG      8131
Leu Arg Asn Arg Leu Thr Ala Ala Thr Gly Leu Asn Leu Pro Asn Thr
2580                2585                2590

CTG CTC TTC GAC CAC CCG ACC CCC CTC TCG CTC GCC TCC CAC CTG CAC      8179
Leu Leu Phe Asp His Pro Thr Pro Leu Ser Leu Ala Ser His Leu His
2595                2600                2605                2610

GAC GAA CTG TTC GGT CCC GAC AGC GAG GCG GAG CCG GCA GCG GCC GCC      8227
Asp Glu Leu Phe Gly Pro Asp Ser Glu Ala Glu Pro Ala Ala Ala Ala
                2615                2620                2625

CCC ACG CCG GTC ATG GCC GAC GAG CGT GAG CCG ATC GCG ATC GTG GGC      8275
Pro Thr Pro Val Met Ala Asp Glu Arg Glu Pro Ile Ala Ile Val Gly
          2630                2635                2640

ATG GCG TGC CGT TAC CCG GGC GGT GTG GCG TCG CCG GAC GAC CTG TGG      8323
Met Ala Cys Arg Tyr Pro Gly Gly Val Ala Ser Pro Asp Asp Leu Trp
     2645                2650                2655

GAC CTG GTG GCC GGT GAC GGG CAC ACG CTC TCC CCG TTC CCG GCC GAC      8371
Asp Leu Val Ala Gly Asp Gly His Thr Leu Ser Pro Phe Pro Ala Asp
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     2660                2665                2670

CGT GGC TGG GAC GTC GAG GGG CTG TAC GAC CCG GAG CCG GGG GTG CCG      8419
Arg Gly Trp Asp Val Glu Gly Leu Tyr Asp Pro Glu Pro Gly Val Pro
2675                2680                2685                2690

GGC AAG AGC TAT GTA CGG GAA GGC GGG TTC CTG CGT TCC GCG GCC GAG      8467
Gly Lys Ser Tyr Val Arg Glu Gly Gly Phe Leu Arg Ser Ala Ala Glu
                2695                2700                2705

TTC GAC GCG GAG TTC TTC GGG ATA TCG CCG CGC GAG GCC ACG GCC ATG      8515
Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg Glu Ala Thr Ala Met
            2710                2715                2720

GAC CCG CAG CAG CGG TTG CTG CTG GAG ACG TCG TGG GAG GCG CTG GAG      8563
Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Leu Glu
        2725                2730                2735

CGG GCC GGC ATC GTT CCG GAC TCG CTG CGC GGC ACC CGG ACC GGT GTC      8611
Arg Ala Gly Ile Val Pro Asp Ser Leu Arg Gly Thr Arg Thr Gly Val
    2740                2745                2750

TTC AGC GGC ATC TCC CAG CAG GAC TAC GCG ACC CAG CTG GGG GAC GCC      8659
Phe Ser Gly Ile Ser Gln Gln Asp Tyr Ala Thr Gln Leu Gly Asp Ala
2755                2760                2765                2770

GCC GAC ACC TAC GGC GGG CAT GTG CTC ACG GGG ACC CTC GGC AGT GTG      8707
Ala Asp Thr Tyr Gly Gly His Val Leu Thr Gly Thr Leu Gly Ser Val
                2775                2780                2785

ATC TCC GGT CGG GTT GCC TAT GCG TTG GGG TTG GAG GGG CCG GCG CTG      8755
Ile Ser Gly Arg Val Ala Tyr Ala Leu Gly Leu Glu Gly Pro Ala Leu
            2790                2795                2800

ACG GTG GAC ACG GCG TGT TCG TCG TCG TTG GTG GCG TTG CAT CTG GCG      8803
Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu His Leu Ala
        2805                2810                2815

GTG CAG TCG TTG CGG CGG GGT GAG TGT GAT CTG GCG TTG GCC GGT GGG      8851
Val Gln Ser Leu Arg Arg Gly Glu Cys Asp Leu Ala Leu Ala Gly Gly
    2820                2825                2830

GTG ACG GTG ATG GCG ACG CCG ACG GTG TTC GTG GAG TTC TCG CGG CAG      8899
Val Thr Val Met Ala Thr Pro Thr Val Phe Val Glu Phe Ser Arg Gln
2835                2840                2845                2850

CGG GGG CTG GCG GCG GAC GGG CGG TGC AAG GCG TTC GCG GAG GGT GCG      8947
Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys Ala Phe Ala Glu Gly Ala
                2855                2860                2865

GAC GGG ACG GCG TGG GCG GAG GGT GTG GGT GTG CTG CTG GTG GAG CGG      8995
Asp Gly Thr Ala Trp Ala Glu Gly Val Gly Val Leu Leu Val Glu Arg
            2870                2875                2880

CTT TCC GAC GCG CGC CGC AAC GGT CAT CGG GTG CTG GCG GTG GTG CGG      9043
Leu Ser Asp Ala Arg Arg Asn Gly His Arg Val Leu Ala Val Val Arg
        2885                2890                2895

GGC AGT GCG GTC AAT CAG GAC GGT GCG AGC AAT GGG CTG ACG GCG CCG      9091
Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro
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     2900                2905                2910

AGT GGT CCG GCG CAG CAG CGG GTG ATC CGT GAG GCG CTG GCT GAT GCG      9139
Ser Gly Pro Ala Gln Gln Arg Val Ile Arg Glu Ala Leu Ala Asp Ala
2915                2920                2925                2930

GGG CTG GTG CCC GCC GAC GTG GAT GTG GTG GAG GCG CAC GGT ACG GGG      9187
Gly Leu Val Pro Ala Asp Val Asp Val Val Glu Ala His Gly Thr Gly
                2935                2940                2945

ACG GCG CTG GGT GAT CCG ATC GAG GCG GGT GCG CTG CTG GCC ACG TAC      9235
Thr Ala Leu Gly Asp Pro Ile Glu Ala Gly Ala Leu Leu Ala Thr Tyr
            2950                2955                2960

GGG CGG GAG CGG GTC GGC GAT CCG TTG TGG CTC GGG TCG TTG AAG TCG      9283
Gly Arg Glu Arg Val Gly Asp Pro Leu Trp Leu Gly Ser Leu Lys Ser
        2965                2970                2975

AAC ATC GGG CAT GCG CAG GCG GCT GCG GGT GTG GGT GGT GTG ATC AAG      9331
Asn Ile Gly His Ala Gln Ala Ala Ala Gly Val Gly Gly Val Ile Lys
    2980                2985                2990

GTG GTG CAG GGG ATG CGG CAT GGG TCG TTG CCG CGG ACG CTG CAT GTG      9379
Val Val Gln Gly Met Arg His Gly Ser Leu Pro Arg Thr Leu His Val
2995                3000                3005                3010

GAT GCG CCG TCG TCG AAG GTG GAG TGG GCT TCG GGT GCG GTG GAG CTG      9427
Asp Ala Pro Ser Ser Lys Val Glu Trp Ala Ser Gly Ala Val Glu Leu
                3015                3020                3025

CTG ACC GAG ACC CGG TCG TGG CCG CGG CGG GTG GAG CGG GTG CGG CGG      9475
Leu Thr Glu Thr Arg Ser Trp Pro Arg Arg Val Glu Arg Val Arg Arg
            3030                3035                3040

GCC GCG GTG TCG GCG TTC GGG GTG AGC GGG ACC AAC GCC CAT GTG GTC      9523
Ala Ala Val Ser Ala Phe Gly Val Ser Gly Thr Asn Ala His Val Val
        3045                3050                3055

CTG GAG GAA GCG CCG GCG GAG GCC GGG AGC GAG CAC GGG GAC GGC CCT      9571
Leu Glu Glu Ala Pro Ala Glu Ala Gly Ser Glu His Gly Asp Gly Pro
    3060                3065                3070

GAA CCT GAG CGG CCC GAC GCG GTG ACG GGT CCG TTG TCG TGG GTG CTT      9619
Glu Pro Glu Arg Pro Asp Ala Val Thr Gly Pro Leu Ser Trp Val Leu
3075                3080                3085                3090

TCT GCG CGG TCG GAG GGG GCG TTG CGG GCG CAG GCG GTG CGG TTG CGT      9667
Ser Ala Arg Ser Glu Gly Ala Leu Arg Ala Gln Ala Val Arg Leu Arg
                3095                3100                3105

GAG TGT GTG GAG CGG GTG GGT GCG GAT CCG CGG GAT GTG GCG GGG TCG      9715
Glu Cys Val Glu Arg Val Gly Ala Asp Pro Arg Asp Val Ala Gly Ser
            3110                3115                3120

TTG GTG GTG TCG CGT GCG TCG TTC GGT GAG CGT GCG GTG GTG GTG GGC      9763
Leu Val Val Ser Arg Ala Ser Phe Gly Glu Arg Ala Val Val Val Gly
        3125                3130                3135

CGG GGG CGT GAG GAG TTG CTG GCG GGT CTG GAT GTG GTG GCT GCC GGG      9811
Arg Gly Arg Glu Glu Leu Leu Ala Gly Leu Asp Val Val Ala Ala Gly
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      3140                3145                3150

GCT CCT GTG GGT GTG TCT TCG GGG GCC GGT GCT GTG GTG CGG GGG AGT      9859
Ala Pro Val Gly Val Ser Ser Gly Ala Gly Ala Val Val Arg Gly Ser
3155                3160                3165                3170

GCG GTG CGG GGT CGT GGG GTG GGG GTG TTG TTC ACG GGT CAG GGT GCG      9907
Ala Val Arg Gly Arg Gly Val Gly Val Leu Phe Thr Gly Gln Gly Ala
                3175                3180                3185

CAG TGG GTT GGT ATG GGG CGT GGG TTG TAT GCG GGG GGT GGG GTG TTT      9955
Gln Trp Val Gly Met Gly Arg Gly Leu Tyr Ala Gly Gly Gly Val Phe
            3190                3195                3200

GCG GAG GTG CTG GAT GAG GTG TTG TCG GTG GTG GGG GAG GTG GAT GGT      10003
Ala Glu Val Leu Asp Glu Val Leu Ser Val Val Gly Glu Val Asp Gly
        3205                3210                3215

CGG TCG TTG CGG GAT GTG ATG TTC GCG GAT GCT GAC TCG GTT TTG GGT      10051
Arg Ser Leu Arg Asp Val Met Phe Ala Asp Ala Asp Ser Val Leu Gly
    3220                3225                3230

GGG TTG TTG GGT CGG ACG GAG TTT GCT CAG CCT GCG TTG TTT GCG TTG      10099
Gly Leu Leu Gly Arg Thr Glu Phe Ala Gln Pro Ala Leu Phe Ala Leu
3235                3240                3245                3250

GAG GTG GCG TTG TTC CGG GCG TTG GAG GCT CGG GGT GTG GAG GTG TCG      10147
Glu Val Ala Leu Phe Arg Ala Leu Glu Ala Arg Gly Val Glu Val Ser
                3255                3260                3265

GTG GTG TTG GGT CAT TCG GTG GGG GAG GTG GCT GCT GCG TAT GTG GCG      10195
Val Val Leu Gly His Ser Val Gly Glu Val Ala Ala Ala Tyr Val Ala
            3270                3275                3280

GGG GTG TTG TCG TTG GGT GAT GCG GTG CGG TTG GTG GTG GCG CGG GGT      10243
Gly Val Leu Ser Leu Gly Asp Ala Val Arg Leu Val Val Ala Arg Gly
        3285                3290                3295

GGG TTG ATG GGT GGG TTG CCG GTG GGT GGG GGG ATG TGG TCG GTG GGG      10291
Gly Leu Met Gly Gly Leu Pro Val Gly Gly Gly Met Trp Ser Val Gly
    3300                3305                3310

GCG TCG GAG TCG GTG GTG CGG GGG GTT GTT GAG GGG TTG GGG GAG TGG      10339
Ala Ser Glu Ser Val Val Arg Gly Val Val Glu Gly Leu Gly Glu Trp
3315                3320                3325                3330

GTG TCG GTT GCG GCG GTG AAT GGG CCG CGG TCG GTG GTG TTG TCG GGT      10387
Val Ser Val Ala Ala Val Asn Gly Pro Arg Ser Val Val Leu Ser Gly
                3335                3340                3345

GAT GTG GGT GTG CTG GAG TCG GTG GTT GTC ACG CTG ATG GGG GAT GGG      10435
Asp Val Gly Val Leu Glu Ser Val Val Val Thr Leu Met Gly Asp Gly
            3350                3355                3360

GTG GAG TGC CGG CGG TTG GAT GTG TCG CAT GGG TTT CAT TCG GTG TTG      10483
Val Glu Cys Arg Arg Leu Asp Val Ser His Gly Phe His Ser Val Leu
        3365                3370                3375

ATG GAG CCG GTG TTG CGG GAG TTC CGG GGG GTT GTG GAG TCG TTG GAG      10531
Met Glu Pro Val Leu Gly Glu Phe Arg Gly Val Val Glu Ser Leu Glu
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    3380                3385                3390

TTC GGT CGG GTG CGG CCG GGT GTG GTG GTG GTG TCG GGT GTG TCG GGT      10579
Phe Gly Arg Val Arg Pro Gly Val Val Val Val Ser Gly Val Ser Gly
3395                3400                3405                3410

GGG GTG GTG GGT TCG GGG GAG TTG GGG GAT CCG GGG TAT TGG GTG CGT      10627
Gly Val Val Gly Ser Gly Glu Leu Gly Asp Pro Gly Tyr Trp Val Arg
                3415                3420                3425

CAT GCG CGG GAG GCG GTG CGT TTC GCG GAT GGG GTG GGG GTG GTG CGT      10675
His Ala Arg Glu Ala Val Arg Phe Ala Asp Gly Val Gly Val Val Arg
            3430                3435                3440

GGT CTG GGT GTG GGG ACG TTG GTG GAG GTG GGT CCG CAT GGG GTG CTG      10723
Gly Leu Gly Val Gly Thr Leu Val Glu Val Gly Pro His Gly Val Leu
        3445                3450                3455

ACG GGG ATG GCG GGT CAG TGC CTG GAG GCC GGT GAT GAT GTG GTG GTG      10771
Thr Gly Met Ala Gly Gln Cys Leu Glu Ala Gly Asp Asp Val Val Val
    3460                3465                3470

GTG CCG GCG ATG CGG CGG GGC CGT CCG GAG CGG GAG GTG TTC GAG GCG      10819
Val Pro Ala Met Arg Arg Gly Arg Pro Glu Arg Glu Val Phe Glu Ala
3475                3480                3485                3490

GCG CTG GCG ACG GTG TTC ACC CGG GAC GCC GGC CTC GAC GCC ACG ACA      10867
Ala Leu Ala Thr Val Phe Thr Arg Asp Ala Gly Leu Asp Ala Thr Thr
                3495                3500                3505

CTC CAC ACC GGG AGC ACC GGC CGA CGC ATC GAC CTC CCC ACC TAC CCC      10915
Leu His Thr Gly Ser Thr Gly Arg Arg Ile Asp Leu Pro Thr Tyr Pro
            3510                3515                3520

TTC CAA CAC AAC CGC TAC TGG GCA ACC GGC TCA GTG ACC GGT GCG ACC      10963
Phe Gln His Asn Arg Tyr Trp Ala Thr Gly Ser Val Thr Gly Ala Thr
        3525                3530                3535

GGC ACC TCG GCA GCC GCG CGC TTC GGC CTG GAG TGG AAG GAC CAC CCC      11011
Gly Thr Ser Ala Ala Ala Arg Phe Gly Leu Glu Trp Lys Asp His Pro
    3540                3545                3550

TTC CTC AGC GGC GCC ACG CCG ATA GCC GGC TCC GGC GCG CTG CTC CTC      11059
Phe Leu Ser Gly Ala Thr Pro Ile Ala Gly Ser Gly Ala Leu Leu Leu
3555                3560                3565                3570

ACC GGC AGG GTG GGG CTC GCT GCC CAC CCG TGG CTG GCC GAC CAC GCC      11107
Thr Gly Arg Val Gly Leu Ala Ala His Pro Trp Leu Ala Asp His Ala
                3575                3580                3585

ATC TCC GGC ACG GTG CTG CTC CCC GGA ACG GCG ATC GCC GAC CTG CTG      11155
Ile Ser Gly Thr Val Leu Leu Pro Gly Thr Ala Ile Ala Asp Leu Leu
            3590                3595                3600

CTG CGG GCG GTC GAG GAG GTC GGC GCC GGA GGG GTC GAG GAA CTG ACG      11203
Leu Arg Ala Val Glu Glu Val Gly Ala Gly Gly Val Glu Glu Leu Thr
        3605                3610                3615

CTC CAT GAG CCC CTG CTC CTC CCC GAG CGA GGC GGC CTG CAC GTC CAG      11251
Leu His Glu Pro Leu Leu Leu Pro Glu Arg Gly Gly Leu His Val Gln
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    3620                3625                3630

GTG CTG GTC GAG GCG GCC GAC GAG CAG GGA CGG CGT GCC GTG GCA GTC     11299
Val Leu Val Glu Ala Ala Asp Glu Gln Gly Arg Arg Ala Val Ala Val
3635                3640                3645                3650

GCC GCA CGC CCG GAG GGC CCT GGG CGG GAC GGT GAG GAA CAG GAG TGG     11347
Ala Ala Arg Pro Glu Gly Pro Gly Arg Asp Gly Glu Glu Gln Glu Trp
                3655                3660                3665

ACC CGG CAC GCG GAA GGC GTG CTC ACC TCC ACC GAG ACG GCC GTT CCG     11395
Thr Arg His Ala Glu Gly Val Leu Thr Ser Thr Glu Thr Ala Val Pro
            3670                3675                3680

GAC ATG GGC TGG GCC GCC GGG GCC TGG CCG CCG CCC GGT GCC GAG CCG     11443
Asp Met Gly Trp Ala Ala Gly Ala Trp Pro Pro Pro Gly Ala Glu Pro
        3685                3690                3695

ATC GAC GTC GAG GAG CTG TAC GAC GCG TTC GCC GCG GAC GGC TAC GGC     11491
Ile Asp Val Glu Glu Leu Tyr Asp Ala Phe Ala Ala Asp Gly Tyr Gly
    3700                3705                3710

TAC GGC CCG GCC TTC ACC GCA CTG TCC GGC GTG TGG CGT CTC GGC GAC     11539
Tyr Gly Pro Ala Phe Thr Ala Leu Ser Gly Val Trp Arg Leu Gly Asp
3715                3720                3725                3730

GAA CTC TTC GCC GAG GTG CGG CGG CCC GCG GGG GGC GCG GGC ACG ACC     11587
Glu Leu Phe Ala Glu Val Arg Arg Pro Ala Gly Gly Ala Gly Thr Thr
                3735                3740                3745

GGT GAC GGT TTC GGC GTC CAC CCC GCA CTC TTC GAT GCG GCC CTC CAC     11635
Gly Asp Gly Phe Gly Val His Pro Ala Leu Phe Asp Ala Ala Leu His
            3750                3755                3760

CCG TGG CGC GCC GGC GGG CTG CTG CCC GAC ACG GGC GGC ACC ACC TGG     11683
Pro Trp Arg Ala Gly Gly Leu Leu Pro Asp Thr Gly Gly Thr Thr Trp
        3765                3770                3775

GCG CCG TTC TCC TGG CAG GGC ATC GCG CTC CAC ACC ACC GGA GCC GAG     11731
Ala Pro Phe Ser Trp Gln Gly Ile Ala Leu His Thr Thr Gly Ala Glu
    3780                3785                3790

ACG CTC CGC GTC AGA CTG GCC CCT GCG GCC GGC GGC ACC GAG TCG GCC     11779
Thr Leu Arg Val Arg Leu Ala Pro Ala Ala Gly Gly Thr Glu Ser Ala
3795                3800                3805                3810

TTC TCC GTA CAG GCC GCC GAC CCG GCG GGC ACC CCG GTC CTC ACC CTC     11827
Phe Ser Val Gln Ala Ala Asp Pro Ala Gly Thr Pro Val Leu Thr Leu
                3815                3820                3825

GAC GCA CTG CTG CTC CGC CCG GTG ACC CTG GGG AGG GCC GAC GCG CCG     11875
Asp Ala Leu Leu Leu Arg Pro Val Thr Leu Gly Arg Ala Asp Ala Pro
            3830                3835                3840

CAA CCG CTG TAC CGC GTC GAC TGG CAG CCG GTC GGC CAG GGG ACC GAG     11923
Gln Pro Leu Tyr Arg Val Asp Trp Gln Pro Val Gly Gln Gly Thr Glu
        3845                3850                3855

GCC TCC GGC GCC CAG GGC TGG ACG GTG CTC GGG CAG GCC GCG GCC GAG     11971
Ala Ser Gly Ala Gln Gly Trp Thr Val Leu Gly Gln Ala Ala Ala Glu
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    3860                3865                3870

ACG GTC GCG CAG CCC GCC GCC CAT GCG GAC CTC ACC GCC CTG CGT ACG     12019
Thr Val Ala Gln Pro Ala Ala His Ala Asp Leu Thr Ala Leu Arg Thr
3875                3880                3885                3890

GCT GTG GCC GCG GCG GGA ACA CCC GTG CCC CGG CTG GTG GTC GTG TCG     12067
Ala Val Ala Ala Ala Gly Thr Pro Val Pro Arg Leu Val Val Val Ser
                3895                3900                3905

CCG GTG GAC ACC CGG CTG GAC GAG GGG CCG GTG CTG GCG GAC GCC GAG     12115
Pro Val Asp Thr Arg Leu Asp Glu Gly Pro Val Leu Ala Asp Ala Glu
            3910                3915                3920

GCT CGG GCC CGT GCG GGT GAC GGC TGG GAC GAC GAT CCC CTA CGT GTC     12163
Ala Arg Ala Arg Ala Gly Asp Gly Trp Asp Asp Asp Pro Leu Arg Val
        3925                3930                3935

GCC CTC GGG CGC GGC CTG ACC CTG GTC CGG GAG TGG GTC GAG GAC GAA     12211
Ala Leu Gly Arg Gly Leu Thr Leu Val Arg Glu Trp Val Glu Asp Glu
    3940                3945                3950

CGG TTG GCG GAC TCC CGG CTC GTC GTC CTC ACC CGT GGC GCG GTG GCG     12259
Arg Leu Ala Asp Ser Arg Leu Val Val Leu Thr Arg Gly Ala Val Ala
3955                3960                3965                3970

GCC GGT CCC GGC GAT GTG CCG GAC CTG ACA GGT GCG GCC CTG TGG GGG     12307
Ala Gly Pro Gly Asp Val Pro Asp Leu Thr Gly Ala Ala Leu Trp Gly
                3975                3980                3985

CTG CTC CGC TCC GCG CAG TCG GAG TAT CCG GAC CGC TTC ACC CTC ATC     12355
Leu Leu Arg Ser Ala Gln Ser Glu Tyr Pro Asp Arg Phe Thr Leu Ile
            3990                3995                4000

GAC GTG GAC GAT TCC CCC GAG TCC CGT GCG GCT CTG CCC CGG GCT CTG     12403
Asp Val Asp Asp Ser Pro Glu Ser Arg Ala Ala Leu Pro Arg Ala Leu
        4005                4010                4015

GGA TCG GCC GAG CGA CAA CTC GCC CTG CGG ACG GGC GAC GTG CTG GCG     12451
Gly Ser Ala Glu Arg Gln Leu Ala Leu Arg Thr Gly Asp Val Leu Ala
    4020                4025                4030

CCG GCC CTG GTC CCG ATG GCC ACC CGG CCG GCG GAG ACC ACT CCA GCG     12499
Pro Ala Leu Val Pro Met Ala Thr Arg Pro Ala Glu Thr Thr Pro Ala
4035                4040                4045                4050

ACG GCG GTC GCC TCG GCG ACA ACA CAG ACA CAG GTC ACC GCG CCC GCT     12547
Thr Ala Val Ala Ser Ala Thr Thr Gln Thr Gln Val Thr Ala Pro Ala
                4055                4060                4065

CCC GAC GAC CCG GCT GCG GAT GCC GTG TTC GAC CCG GCG GGC ACC GTA     12595
Pro Asp Asp Pro Ala Ala Asp Ala Val Phe Asp Pro Ala Gly Thr Val
            4070                4075                4080

CTG ATC ACC GGC GGC ACC GGC GCC CTG GGA CGG CGT GTC GCC TCG CAC     12643
Leu Ile Thr Gly Gly Thr Gly Ala Leu Gly Arg Arg Val Ala Ser His
        4085                4090                4095

CTC GCG CGC CGG TAC GGC GTA CGC CAC ATG CTT CTG GTC AGC AGG CGT     12691
Leu Ala Arg Arg Tyr Gly Val Arg His Met Leu Leu Val Ser Arg Arg
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    4100                4105                4110

GGA CCG GAC GCC CCC GAG GCC GGT CCC CTG GAA CGG GAA CTC GCC GGT      12739
Gly Pro Asp Ala Pro Glu Ala Gly Pro Leu Glu Arg Glu Leu Ala Gly
4115                4120                4125                4130

CTC GGA GTC ACC GCC ACC TTC CTG GCA TGC GAC CTC ACC GAC ATC GAG      12787
Leu Gly Val Thr Ala Thr Phe Leu Ala Cys Asp Leu Thr Asp Ile Glu
                4135                4140                4145

GCC GTA CGG AAG GCC GTC GCC GCG GTG CCG TCG GAC CAC CCG CTG ACC      12835
Ala Val Arg Lys Ala Val Ala Ala Val Pro Ser Asp His Pro Leu Thr
            4150                4155                4160

GGT GTG GTG CAC ACC GCC GGC GTG CTG GAC GAC GGC GCC CTG ACC GGC      12883
Gly Val Val His Thr Ala Gly Val Leu Asp Asp Gly Ala Leu Thr Gly
        4165                4170                4175

CTG ACC CGG CAA CGC CTC GAC ACC GTG CTG CGG CCC AAG GCC GAC GCC      12931
Leu Thr Arg Gln Arg Leu Asp Thr Val Leu Arg Pro Lys Ala Asp Ala
    4180                4185                4190

GTG CGG AAC CTC CAC GAG GCG ACC CTC GAC CGG CCG CTG CGC GCG TTC      12979
Val Arg Asn Leu His Glu Ala Thr Leu Asp Arg Pro Leu Arg Ala Phe
4195                4200                4205                4210

GTC CTG TTC TCC GCC GCC GCC GGA CTC CTG GGC CGC CCC GGG CAG GCC      13027
Val Leu Phe Ser Ala Ala Ala Gly Leu Leu Gly Arg Pro Gly Gln Ala
                4215                4220                4225

TCC TAC GCC GCC GCC AAC GCG GTC CTC GAC GCG CTC GCG GGA GCC CGC      13075
Ser Tyr Ala Ala Ala Asn Ala Val Leu Asp Ala Leu Ala Gly Ala Arg
            4230                4235                4240

CGC GCG GCC GGA CTG CCC GCA GTG TCC CTG GCG TGG GGC CTG TGG GAC      13123
Arg Ala Ala Gly Leu Pro Ala Val Ser Leu Ala Trp Gly Leu Trp Asp
        4245                4250                4255

GAG CAG ACG GGC ATG GCA GGA GGC CTC GAC GAG ATG GCC CTG CGC GTG      13171
Glu Gln Thr Gly Met Ala Gly Gly Leu Asp Glu Met Ala Leu Arg Val
    4260                4265                4270

CTG CGC CGG GAC GGC ATC GCC GCG ATG CCT CCG GAG CAG GGG CTC GAA      13219
Leu Arg Arg Asp Gly Ile Ala Ala Met Pro Pro Glu Gln Gly Leu Glu
4275                4280                4285                4290

CTG CTC GAC CTG GCC CTG ACC GGA CAC CGG GAC GGA CCC GCC GTC CTC      13267
Leu Leu Asp Leu Ala Leu Thr Gly His Arg Asp Gly Pro Ala Val Leu
                4295                4300                4305

GTC CCC CTC CTC CTC GAC GGC GCG GCC CTG CGC CGC ACG GCG AAG GAG      13315
Val Pro Leu Leu Leu Asp Gly Ala Ala Leu Arg Arg Thr Ala Lys Glu
            4310                4315                4320

CGC GGC GCG GCC ACG ATG TCC CCC TTG CTG CGC GCC CTG CTG CCC GCC      13363
Arg Gly Ala Ala Thr Met Ser Pro Leu Leu Arg Ala Leu Leu Pro Ala
        4325                4330                4335

GCC CTG CGC CGC AGC GGT GGA GCC GGC GCC CCC GCG GCG GCC GAC CGG      13411
Ala Leu Arg Arg Ser Gly Gly Ala Gly Ala Pro Ala Ala Ala Asp Arg
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     4340                4345                4350

CAC GGC AAG GAG GCG GAC CCC GGT GCG GGA CGC CTC GCA GGG ATG GTG      13459
His Gly Lys Glu Ala Asp Pro Gly Ala Gly Arg Leu Ala Gly Met Val
4355                4360                4365                4370

GCA CTC GAA GCG GCG GAG CGT TCC GCG GCC GTC CTT GAG CTG GTC ACC      13507
Ala Leu Glu Ala Ala Glu Arg Ser Ala Ala Val Leu Glu Leu Val Thr
                4375                4380                4385

GAA CAG GTC GCC GAG GTC CTC GGC TAC GCG TCG GCC GCG GAG ATC GAG      13555
Glu Gln Val Ala Glu Val Leu Gly Tyr Ala Ser Ala Ala Glu Ile Glu
          4390                4395                4400

CCC GAA CGA CCC TTC CGG GAG ATC GGC GTC GAC TCC CTG GCG GCG GTG      13603
Pro Glu Arg Pro Phe Arg Glu Ile Gly Val Asp Ser Leu Ala Ala Val
     4405                4410                4415

GAG CTG CGC AAC CGG CTC AGC CGT CTG GTC GGC CTG CGG TTG CCG ACC      13651
Glu Leu Arg Asn Arg Leu Ser Arg Leu Val Gly Leu Arg Leu Pro Thr
4420                4425                4430

ACG CTG TCC TTC GAC CAC CCC ACG CCG AAG GAC ATG GCG CAG CAC ATC      13699
Thr Leu Ser Phe Asp His Pro Thr Pro Lys Asp Met Ala Gln His Ile
4435                4440                4445                4450

GAC GGG CAG CTC CCC CGC CCG GCC GGA GCC TCG CCC GCG GAC GCA GCG      13747
Asp Gly Gln Leu Pro Arg Pro Ala Gly Ala Ser Pro Ala Asp Ala Ala
                4455                4460                4465

CTG GAA GGG ATC GGC GAC CTC GCG CGG GCG GTC GCC CTG CTG GGC ACG      13795
Leu Glu Gly Ile Gly Asp Leu Ala Arg Ala Val Ala Leu Leu Gly Thr
          4470                4475                4480

GGC GAC GCC CGC CGG GCC GAG GTA CGA GAG CAG CTC GTC GGA CTG CTG      13843
Gly Asp Ala Arg Arg Ala Glu Val Arg Glu Gln Leu Val Gly Leu Leu
     4485                4490                4495

GCC GCG CTC GAC CCA CCT GGG CGG ACG GGC ACC GCC GCA CCC GGC GTC      13891
Ala Ala Leu Asp Pro Pro Gly Arg Thr Gly Thr Ala Ala Pro Gly Val
4500                4505                4510

CCC TCC GGT GCC GAT GGC GCG GAA CCG ACC GTG ACG GAC CGG CTC GAC      13939
Pro Ser Gly Ala Asp Gly Ala Glu Pro Thr Val Thr Asp Arg Leu Asp
4515                4520                4525                4530

GAG GCG ACC GAC GAC GAG ATC TTC GCC TTC CTG GAC GAG CAG CTG TGA      13987
Glu Ala Thr Asp Asp Glu Ile Phe Ala Phe Leu Asp Glu Gln Leu  *
                4535                4540                4545
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(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 4546 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

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Met Ser Gly Glu Leu Ala Ile Ser Arg Ser Asp Asp Arg Ser Asp Ala
 1               5                  10                  15

Val Ala Val Val Gly Met Ala Cys Arg Phe Pro Gly Ala Pro Gly Ile
            20                  25                  30

Ala Glu Phe Trp Glu Leu Leu Arg Ser Gly Arg Gly Met Pro Thr Arg
        35                  40                  45

Gln Asp Asp Gly Thr Trp Arg Ala Ala Leu Glu Asp His Ala Gly Phe
    50                  55                  60

Asp Ala Gly Phe Phe Gly Met Asn Ala Arg Gln Ala Ala Ala Thr Asp
65                  70                  75                  80

Pro Gln His Arg Leu Met Leu Glu Leu Gly Trp Glu Ala Leu Glu Asp
                85                  90                  95

Ala Gly Ile Val Pro Gly Asp Leu Thr Gly Thr Asp Thr Gly Val Phe
            100                 105                 110

Ala Gly Val Ala Ser Asp Asp Tyr Ala Val Leu Thr Arg Arg Ser Ala
        115                 120                 125

Val Ser Ala Gly Gly Tyr Thr Ala Thr Gly Leu His Arg Ala Leu Ala
    130                 135                 140

Ala Asn Arg Leu Ser His Phe Leu Gly Leu Arg Gly Pro Ser Leu Val
145                 150                 155                 160

Val Asp Ser Ala Gln Ser Ala Ser Leu Val Ala Val Gln Leu Ala Cys
                165                 170                 175

Glu Ser Leu Arg Arg Gly Glu Thr Ser Leu Ala Val Ala Gly Gly Val
            180                 185                 190

Asn Leu Ile Leu Thr Glu Glu Ser Thr Thr Val Met Glu Arg Met Gly
        195                 200                 205

Ala Leu Ser Pro Asp Gly Arg Cys His Thr Phe Asp Ala Arg Ala Asn
    210                 215                 220

Gly Tyr Val Arg Gly Glu Gly Gly Gly Ala Val Val Leu Lys Pro Leu
225                 230                 235                 240

Asp Ala Ala Leu Ala Asp Gly Asp Arg Val Tyr Cys Val Ile Lys Gly
                245                 250                 255

Gly Ala Val Asn Asn Asp Gly Gly Gly Ala Ser Leu Thr Thr Pro Asp
            260                 265                 270

Arg Glu Ala Gln Glu Ala Val Leu Arg Gln Ala Tyr Arg Arg Ala Gly
        275                 280                 285

Val Ser Thr Gly Ala Val Arg Tyr Val Glu Leu His Gly Thr Gly Thr
    290                 295                 300

Arg Ala Gly Asp Pro Val Glu Ala Ala Ala Leu Gly Ala Val Leu Gly
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305 310 315 320

Ala Gly Ala Asp Ser Gly Arg Ser Thr Pro Leu Ala Val Gly Ser Val
325 330 335

Lys Thr Asn Val Gly His Leu Glu Gly Ala Ala Gly Ile Val Gly Leu
340 345 350

Ile Lys Ala Thr Leu Cys Val Arg Lys Gly Glu Leu Val Pro Ser Leu
355 360 365

Asn Phe Ser Thr Pro Asn Pro Asp Ile Pro Leu Asp Asp Leu Arg Leu
370 375 380

Arg Val Gln Thr Glu Arg Gln Glu Trp Asn Glu Glu Asp Asp Arg Pro
385 390 395 400

Arg Val Ala Gly Val Ser Ser Phe Gly Met Gly Gly Thr Asn Val His
405 410 415

Leu Val Ile Ala Glu Ala Pro Ala Ala Ala Gly Ser Ser Gly Ala Gly
420 425 430

Gly Ser Gly Ala Gly Ser Gly Ala Gly Ile Ser Ala Val Ser Gly Val
435 440 445

Val Pro Val Val Val Ser Gly Arg Ser Arg Val Val Val Arg Glu Ala
450 455 460

Ala Gly Arg Leu Ala Glu Val Val Glu Ala Gly Gly Val Gly Leu Ala
465 470 475 480

Asp Val Ala Val Thr Met Ala Asp Arg Ser Arg Phe Gly Tyr Arg Ala
485 490 495

Val Val Leu Ala Arg Gly Glu Ala Glu Leu Ala Gly Arg Leu Arg Ala
500 505 510

Leu Ala Gly Gly Asp Pro Asp Ala Gly Val Val Thr Gly Ala Val Leu
515 520 525

Asp Gly Gly Val Val Val Gly Ala Ala Pro Gly Gly Ala Gly Ala Ala
530 535 540

Gly Gly Ala Gly Ala Ala Gly Gly Ala Gly Gly Gly Gly Val Val Leu
545 550 555 560

Val Phe Pro Gly Gln Gly Thr Gln Trp Val Gly Met Gly Ala Gly Leu
565 570 575

Leu Gly Ser Ser Glu Val Phe Ala Ala Ser Met Arg Glu Cys Ala Arg
580 585 590

Ala Leu Ser Val His Val Gly Trp Asp Leu Leu Glu Val Val Ser Gly
595 600 605

Gly Ala Gly Leu Glu Arg Val Asp Val Val Gln Pro Val Thr Trp Ala
610 615 620

Val Met Val Ser Leu Ala Arg Tyr Trp Gln Ala Met Gly Val Asp Val

625 630 635 640

Ala Ala Val Val Gly His Ser Gln Gly Glu Ile Ala Ala Ala Thr Val
645 650 655

Ala Gly Ala Leu Ser Leu Glu Asp Ala Ala Ala Val Val Ala Leu Arg
660 665 670

Ala Gly Leu Ile Gly Arg Tyr Leu Ala Gly Arg Gly Ala Met Ala Ala
675 680 685

Val Pro Leu Pro Ala Gly Glu Val Glu Ala Gly Leu Ala Lys Trp Pro
690 695 700

Gly Val Glu Val Ala Ala Val Asn Gly Pro Ala Ser Thr Val Val Ser
705 710 715 720

Gly Asp Arg Arg Ala Val Ala Gly Tyr Val Ala Val Cys Gln Ala Glu
725 730 735

Gly Val Gln Ala Arg Leu Ile Pro Val Asp Tyr Ala Ser His Ser Arg
740 745 750

His Val Glu Asp Leu Lys Gly Glu Leu Glu Arg Val Leu Ser Gly Ile
755 760 765

Arg Pro Arg Ser Pro Arg Val Pro Val Cys Ser Thr Val Ala Gly Glu
770 775 780

Gln Pro Gly Glu Pro Val Phe Asp Ala Gly Tyr Trp Phe Arg Asn Leu
785 790 795 800

Arg Asn Arg Val Glu Phe Ser Ala Val Val Gly Gly Leu Leu Glu Glu
805 810 815

Gly His Arg Arg Phe Ile Glu Val Ser Ala His Pro Val Leu Val His
820 825 830

Ala Ile Glu Gln Thr Ala Glu Ala Ala Asp Arg Ser Val His Ala Thr
835 840 845

Gly Thr Leu Arg Arg Gln Asp Asp Ser Pro His Arg Leu Leu Thr Ser
850 855 860

Thr Ala Glu Ala Trp Ala His Gly Ala Thr Leu Thr Trp Asp Pro Ala
865 870 875 880

Leu Pro Pro Gly His Leu Thr Thr Leu Pro Thr Tyr Pro Phe Asn His
885 890 895

His His Tyr Trp Leu Asp Thr Ile Asp Gly Gly Gly Gly Asp Asp Ala
900 905 910

Thr Gln Glu Lys Glu Ser Gly Pro Leu Thr Arg Glu Leu Arg Gly Leu
915 920 925

Pro Ser Ser Gln Lys Gln Leu Gly Phe Leu Leu Asp Leu Val Cys Arg
930 935 940

His Thr Ala Val Val Leu Gly Leu Asp Thr Ala Ala Glu Val Asp Pro

945 950 955 960

Asp Leu Ser Phe Lys Lys Gln Gly Ile Gln Ser Met Thr Gly Val Glu
965 970 975

Leu Arg Asn Arg Leu Leu Thr Glu Thr Gly Leu Ala Leu Pro Thr Thr
980 985 990

Leu Val Tyr Asp Arg Pro Thr Pro Arg Ala Leu Ala Gln Phe Leu His
995 1000 1005

Thr Glu Leu Leu Asp Gly Ser Pro Ser Gly Ser Val Leu Ala Pro Ala
1010 1015 1020

Gln Lys Ser Phe Glu Ala Gly Gly Pro Gly Val Leu Ser Ser Ala Ala
1025 1030 1035 1040

Val Gly Val Ser Asp Ala Arg Gly Gly Ser Arg Asp Asp Asp Asp Pro
1045 1050 1055

Ile Ala Ile Val Gly Val Gly Cys Arg Leu Pro Gly Gly Val Asp Ser
1060 1065 1070

Arg Ala Ala Leu Trp Glu Leu Leu Glu Ser Gly Ala Asp Ala Ile Ser
1075 1080 1085

Ser Phe Pro Thr Asp Arg Gly Trp Asp Leu Asp Gly Leu Tyr Asp Pro
1090 1095 1100

Glu Pro Gly Thr Pro Gly Lys Thr Tyr Val Arg Glu Gly Gly Phe Leu
1105 1110 1115 1120

His Ser Ala Ala Glu Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg
1125 1130 1135

Glu Ala Thr Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Ala Ser
1140 1145 1150

Trp Glu Ala Leu Glu Asp Ala Gly Val Leu Pro Glu Ser Leu Arg Gly
1155 1160 1165

Gly Asp Ala Gly Val Phe Val Gly Ala Thr Ala Pro Glu Tyr Gly Pro
1170 1175 1180

Arg Leu His Glu Gly Ala Asp Gly Tyr Glu Gly Tyr Leu Leu Thr Gly
1185 1190 1195 1200

Thr Thr Ala Ser Val Ala Ser Gly Arg Ile Ala Tyr Thr Leu Gly Thr
1205 1210 1215

Gly Gly Pro Ala Leu Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val
1220 1225 1230

Ala Leu His Leu Ala Val Gln Ala Leu Arg Arg Gly Glu Cys Gly Leu
1235 1240 1245

Ala Leu Ala Gly Gly Ala Thr Val Met Ser Gly Pro Gly Met Phe Val
1250 1255 1260

Glu Phe Ser Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Met Pro

1265 1270 1275 1280

Phe Ser Ala Asp Ala Asp Gly Thr Ala Trp Ser Glu Gly Val Ala Val
1285 1290 1295

Leu Ala Leu Glu Arg Leu Ser Asp Ala Arg Arg Ala Gly His Arg Val
1300 1305 1310

Leu Gly Val Val Arg Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn
1315 1320 1325

Gly Leu Thr Ala Pro Asn Arg Ser Ala Gln Glu Gly Val Ile Arg Ala
1330 1335 1340

Ala Leu Ala Asp Ala Gly Leu Ala Pro Gly Asp Val Asp Ala Val Glu
1345 1350 1355 1360

Ala His Gly Thr Gly Thr Ala Leu Gly Asp Pro Ile Glu Ala Ser Ala
1365 1370 1375

Leu Leu Ala Thr Tyr Gly Arg Glu Arg Val Gly Asp Pro Leu Trp Leu
1380 1385 1390

Gly Ser Leu Lys Ser Asn Val Gly His Thr Gln Ala Ala Ala Gly Ala
1395 1400 1405

Ala Gly Val Val Lys Met Leu Leu Ala Leu Glu His Gly Thr Leu Pro
1410 1415 1420

Arg Thr Leu His Ala Asp Arg Pro Ser Thr His Val Asp Trp Ser Ser
1425 1430 1435 1440

Gly Thr Val Ala Leu Leu Ala Glu Ala Arg Arg Trp Pro Arg Arg Ser
1445 1450 1455

Asp Arg Pro Arg Arg Ala Ala Val Ser Ser Phe Gly Ile Ser Gly Thr
1460 1465 1470

Asn Ala His Leu Ile Ile Glu Glu Ala Pro Glu Trp Val Glu Asp Ile
1475 1480 1485

Asp Gly Val Ala Ala Pro Asp Arg Gly Thr Ala Asp Ala Ala Ala Pro
1490 1495 1500

Ser Pro Leu Leu Leu Ser Ala Arg Ser Glu Gly Ala Leu Arg Ala Gln
1505 1510 1515 1520

Ala Val Arg Leu Gly Glu Tyr Val Glu Arg Val Gly Ala Asp Pro Arg
1525 1530 1535

Asp Val Ala Tyr Ser Leu Ala Ser Thr Arg Thr Leu Phe Glu His Arg
1540 1545 1550

Ala Val Val Pro Cys Gly Gly Arg Gly Glu Leu Val Ala Ala Leu Gly
1555 1560 1565

Gly Phe Ala Ala Gly Arg Val Ser Gly Gly Val Arg Ser Gly Arg Ala
1570 1575 1580

Val Pro Gly Gly Val Gly Val Leu Phe Thr Gly Gln Gly Ala Gln Trp

1585 1590 1595 1600

Val Gly Met Gly Arg Gly Leu Tyr Ala Gly Gly Gly Val Phe Ala Glu
1605 1610 1615

Val Leu Asp Glu Val Leu Ser Met Val Gly Glu Val Asp Gly Arg Ser
1620 1625 1630

Leu Arg Asp Val Met Phe Gly Asp Val Asp Val Asp Ala Gly Ala Gly
1635 1640 1645

Ala Asp Ala Gly Ala Gly Ala Gly Ala Gly Val Gly Ser Gly Ser Gly
1650 1655 1660

Ser Val Gly Gly Leu Leu Gly Arg Thr Glu Phe Ala Gln Pro Ala Leu
1665 1670 1675 1680

Phe Ala Leu Glu Val Ala Leu Phe Arg Ala Leu Glu Ala Arg Gly Val
1685 1690 1695

Glu Val Ser Val Val Leu Gly His Ser Val Gly Glu Val Ala Ala Ala
1700 1705 1710

Tyr Val Ala Gly Val Leu Ser Leu Gly Asp Ala Val Arg Leu Val Val
1715 1720 1725

Ala Arg Gly Gly Leu Met Gly Gly Leu Pro Val Gly Gly Gly Met Trp
1730 1735 1740

Ser Val Gly Ala Ser Glu Ser Val Val Arg Gly Val Val Glu Gly Leu
1745 1750 1755 1760

Gly Glu Trp Val Ser Val Ala Ala Val Asn Gly Pro Arg Ser Val Val
1765 1770 1775

Leu Ser Gly Asp Val Gly Val Leu Glu Ser Val Val Ala Ser Leu Met
1780 1785 1790

Gly Asp Gly Val Glu Cys Arg Arg Leu Asp Val Ser His Gly Phe His
1795 1800 1805

Ser Val Leu Met Glu Pro Val Leu Gly Glu Phe Arg Gly Val Val Glu
1810 1815 1820

Ser Leu Glu Phe Gly Arg Val Arg Pro Gly Val Val Val Val Ser Gly
1825 1830 1835 1840

Val Ser Gly Gly Val Val Gly Ser Gly Glu Leu Gly Asp Pro Gly Tyr
1845 1850 1855

Trp Val Arg His Ala Arg Glu Ala Val Arg Phe Ala Asp Gly Val Gly
1860 1865 1870

Val Val Arg Gly Leu Gly Val Gly Thr Leu Val Glu Val Gly Pro His
1875 1880 1885

Gly Val Leu Thr Gly Met Ala Gly Glu Cys Leu Gly Ala Gly Asp Asp
1890 1895 1900

Val Val Val Val Pro Ala Met Arg Arg Gly Arg Ala Glu Arg Glu Val

1905 1910 1915 1920

Phe Glu Ala Ala Leu Ala Thr Val Phe Thr Arg Asp Ala Gly Leu Asp
1925 1930 1935

Ala Thr Ala Leu His Thr Gly Ser Thr Gly Arg Arg Ile Asp Leu Pro
1940 1945 1950

Thr Tyr Pro Phe Gln Arg Asp Arg Tyr Trp Leu Asp Pro Val Arg Thr
1955 1960 1965

Ala Val Thr Gly Val Glu Pro Ala Gly Ser Pro Ala Asp Ala Arg Ala
1970 1975 1980

Thr Glu Arg Gly Arg Ser Thr Thr Ala Gly Ile Arg Tyr Arg Val Ala
1985 1990 1995 2000

Trp Gln Pro Ala Val Val Asp Arg Gly Asn Pro Gly Pro Ala Gly His
2005 2010 2015

Val Leu Leu Leu Ala Pro Asp Glu Asp Thr Ala Asp Ser Gly Leu Ala
2020 2025 2030

Pro Ala Ile Ala Arg Glu Leu Ala Val Arg Gly Ala Glu Val His Thr
2035 2040 2045

Val Ala Val Pro Val Gly Thr Gly Arg Glu Ala Ala Gly Asp Leu Leu
2050 2055 2060

Arg Ala Ala Gly Asp Gly Ala Ala Arg Ser Thr Arg Val Leu Trp Leu
2065 2070 2075 2080

Ala Pro Ala Glu Pro Asp Ala Ala Asp Ala Val Ala Leu Val Gln Ala
2085 2090 2095

Leu Gly Glu Ala Val Pro Glu Ala Pro Leu Trp Ile Thr Thr Arg Glu
2100 2105 2110

Ala Ala Ala Val Arg Pro Asp Glu Thr Pro Ser Val Gly Gly Ala Gln
2115 2120 2125

Leu Trp Gly Leu Gly Gln Val Ala Ala Leu Glu Leu Gly Arg Arg Trp
2130 2135 2140

Gly Gly Leu Ala Asp Leu Pro Gly Ser Ala Ser Pro Ala Val Leu Arg
2145 2150 2155 2160

Thr Phe Val Gly Ala Leu Leu Ala Gly Gly Glu Asn Gln Phe Ala Val
2165 2170 2175

Arg Pro Ser Gly Val His Val Arg Arg Val Val Pro Ala Pro Val Pro
2180 2185 2190

Val Pro Ala Ser Ala Arg Thr Val Thr Thr Ala Pro Ala Thr Ala Val
2195 2200 2205

Gly Glu Asp Ala Arg Asn Asp Thr Ser Asp Val Val Val Pro Asp Asp
2210 2215 2220

Arg Trp Ser Ser Gly Thr Val Leu Ile Thr Gly Gly Thr Gly Ala Leu

2225 2230 2235 2240

Gly Ala Gln Val Ala Arg Arg Leu Ala Arg Ser Gly Ala Ala Arg Leu
2245 2250 2255

Leu Leu Val Gly Arg Arg Gly Ala Ala Gly Pro Gly Val Gly Glu Leu
2260 2265 2270

Val Glu Glu Leu Thr Ala Leu Gly Ser Glu Val Ala Val Glu Ala Cys
2275 2280 2285

Asp Val Ala Asp Arg Asp Ala Leu Ala Ala Leu Leu Ala Gly Leu Pro
2290 2295 2300

Glu Glu Arg Pro Leu Val Ala Val Leu His Ala Ala Gly Val Leu Asp
2305 2310 2315 2320

Asp Gly Val Leu Asp Ser Leu Thr Ser Asp Arg Val Asp Ala Val Leu
2325 2330 2335

Arg Asp Lys Val Thr Ala Ala Arg His Leu Asp Glu Leu Thr Ala Asp
2340 2345 2350

Leu Pro Leu Asp Ala Phe Val Leu Phe Ser Ser Ile Val Gly Val Trp
2355 2360 2365

Gly Asn Gly Gly Gln Ala Val Tyr Ala Ala Ala Asn Ala Ala Leu Asp
2370 2375 2380

Ala Leu Ala Gln Arg Arg Arg Ala Arg Gly Ala Arg Ala Ala Ser Ile
2385 2390 2395 2400

Ala Trp Gly Pro Trp Ala Gly Ala Gly Met Ala Ser Gly Thr Ala Ala
2405 2410 2415

Lys Ser Phe Glu Arg Asp Gly Val Thr Ala Leu Asp Pro Glu Arg Ala
2420 2425 2430

Leu Asp Val Leu Asp Asp Val Val Gly Ala Gly Gly Thr Ser Ala Ala
2435 2440 2445

Gly Thr His Ala Ala Gly Glu Ser Ser Leu Leu Val Ala Asp Val Asp
2450 2455 2460

Trp Glu Thr Phe Val Gly Arg Ser Val Thr Arg Arg Thr Trp Ser Leu
2465 2470 2475 2480

Phe Asp Gly Val Ser Ala Ala Arg Ser Ala Arg Ala Gly His Ala Ala
2485 2490 2495

Asp Asp Arg Ala Ala Leu Thr Pro Gly Thr Arg Pro Gly Asp Gly Ala
2500 2505 2510

Pro Gly Gly Ser Gly Gln Asp Gly Gly Glu Gly Arg Pro Trp Leu Ser
2515 2520 2525

Val Gly Pro Ser Pro Ala Glu Arg Arg Arg Ala Leu Leu Thr Leu Val
2530 2535 2540

Arg Ser Glu Ala Ala Gly Ile Leu Arg His Ala Ser Ala Asp Ala Val

2545 2550 2555 2560

Asp Pro Glu Leu Ala Phe Arg Ser Ala Gly Phe Asp Ser Leu Thr Val
2565 2570 2575

Leu Glu Leu Arg Asn Arg Leu Thr Ala Ala Thr Gly Leu Asn Leu Pro
2580 2585 2590

Asn Thr Leu Leu Phe Asp His Pro Thr Pro Leu Ser Leu Ala Ser His
2595 2600 2605

Leu His Asp Glu Leu Phe Gly Pro Asp Ser Glu Ala Glu Pro Ala Ala
2610 2615 2620

Ala Ala Pro Thr Pro Val Met Ala Asp Glu Arg Glu Pro Ile Ala Ile
2625 2630 2635 2640

Val Gly Met Ala Cys Arg Tyr Pro Gly Gly Val Ala Ser Pro Asp Asp
2645 2650 2655

Leu Trp Asp Leu Val Ala Gly Asp Gly His Thr Leu Ser Pro Phe Pro
2660 2665 2670

Ala Asp Arg Gly Trp Asp Val Glu Gly Leu Tyr Asp Pro Glu Pro Gly
2675 2680 2685

Val Pro Gly Lys Ser Tyr Val Arg Glu Gly Gly Phe Leu Arg Ser Ala
2690 2695 2700

Ala Glu Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro Arg Glu Ala Thr
2705 2710 2715 2720

Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala
2725 2730 2735

Leu Glu Arg Ala Gly Ile Val Pro Asp Ser Leu Arg Gly Thr Arg Thr
2740 2745 2750

Gly Val Phe Ser Gly Ile Ser Gln Gln Asp Tyr Ala Thr Gln Leu Gly
2755 2760 2765

Asp Ala Ala Asp Thr Tyr Gly Gly His Val Leu Thr Gly Thr Leu Gly
2770 2775 2780

Ser Val Ile Ser Gly Arg Val Ala Tyr Ala Leu Gly Leu Glu Gly Pro
2785 2790 2795 2800

Ala Leu Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu His
2805 2810 2815

Leu Ala Val Gln Ser Leu Arg Arg Gly Glu Cys Asp Leu Ala Leu Ala
2820 2825 2830

Gly Gly Val Thr Val Met Ala Thr Pro Thr Val Phe Val Glu Phe Ser
2835 2840 2845

Arg Gln Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys Ala Phe Ala Glu
2850 2855 2860

Gly Ala Asp Gly Thr Ala Trp Ala Glu Gly Val Gly Val Leu Leu Val

2865 2870 2875 2880

Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly His Arg Val Leu Ala Val
2885 2890 2895

Val Arg Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr
2900 2905 2910

Ala Pro Ser Gly Pro Ala Gln Gln Arg Val Ile Arg Glu Ala Leu Ala
2915 2920 2925

Asp Ala Gly Leu Val Pro Ala Asp Val Asp Val Val Glu Ala His Gly
2930 2935 2940

Thr Gly Thr Ala Leu Gly Asp Pro Ile Glu Ala Gly Ala Leu Leu Ala
2945 2950 2955 2960

Thr Tyr Gly Arg Glu Arg Val Gly Asp Pro Leu Trp Leu Gly Ser Leu
2965 2970 2975

Lys Ser Asn Ile Gly His Ala Gln Ala Ala Ala Gly Val Gly Gly Val
2980 2985 2990

Ile Lys Val Val Gln Gly Met Arg His Gly Ser Leu Pro Arg Thr Leu
2995 3000 3005

His Val Asp Ala Pro Ser Ser Lys Val Glu Trp Ala Ser Gly Ala Val
3010 3015 3020

Glu Leu Leu Thr Glu Thr Arg Ser Trp Pro Arg Arg Val Glu Arg Val
3025 3030 3035 3040

Arg Arg Ala Ala Val Ser Ala Phe Gly Val Ser Gly Thr Asn Ala His
3045 3050 3055

Val Val Leu Glu Glu Ala Pro Ala Glu Ala Gly Ser Glu His Gly Asp
3060 3065 3070

Gly Pro Glu Pro Glu Arg Pro Asp Ala Val Thr Gly Pro Leu Ser Trp
3075 3080 3085

Val Leu Ser Ala Arg Ser Glu Gly Ala Leu Arg Ala Gln Ala Val Arg
3090 3095 3100

Leu Arg Glu Cys Val Glu Arg Val Gly Ala Asp Pro Arg Asp Val Ala
3105 3110 3115 3120

Gly Ser Leu Val Val Ser Arg Ala Ser Phe Gly Glu Arg Ala Val Val
3125 3130 3135

Val Gly Arg Gly Arg Glu Glu Leu Leu Ala Gly Leu Asp Val Val Ala
3140 3145 3150

Ala Gly Ala Pro Val Gly Val Ser Ser Gly Ala Gly Ala Val Val Arg
3155 3160 3165

Gly Ser Ala Val Arg Gly Arg Gly Val Gly Val Leu Phe Thr Gly Gln
3170 3175 3180

Gly Ala Gln Trp Val Gly Met Gly Arg Gly Leu Tyr Ala Gly Gly Gly

3185 3190 3195 3200

Val Phe Ala Glu Val Leu Asp Glu Val Leu Ser Val Val Gly Glu Val
3205 3210 3215

Asp Gly Arg Ser Leu Arg Asp Val Met Phe Ala Asp Ala Asp Ser Val
3220 3225 3230

Leu Gly Gly Leu Leu Gly Arg Thr Glu Phe Ala Gln Pro Ala Leu Phe
3235 3240 3245

Ala Leu Glu Val Ala Leu Phe Arg Ala Leu Glu Ala Arg Gly Val Glu
3250 3255 3260

Val Ser Val Val Leu Gly His Ser Val Gly Glu Val Ala Ala Ala Tyr
3265 3270 3275 3280

Val Ala Gly Val Leu Ser Leu Gly Asp Ala Val Arg Leu Val Val Ala
3285 3290 3295

Arg Gly Gly Leu Met Gly Gly Leu Pro Val Gly Gly Gly Met Trp Ser
3300 3305 3310

Val Gly Ala Ser Glu Ser Val Val Arg Gly Val Val Glu Gly Leu Gly
3315 3320 3325

Glu Trp Val Ser Val Ala Ala Val Asn Gly Pro Arg Ser Val Val Leu
3330 3335 3340

Ser Gly Asp Val Gly Val Leu Glu Ser Val Val Val Thr Leu Met Gly
3345 3350 3355 3360

Asp Gly Val Glu Cys Arg Arg Leu Asp Val Ser His Gly Phe His Ser
3365 3370 3375

Val Leu Met Glu Pro Val Leu Gly Glu Phe Arg Gly Val Val Glu Ser
3380 3385 3390

Leu Glu Phe Gly Arg Val Arg Pro Gly Val Val Val Val Ser Gly Val
3395 3400 3405

Ser Gly Gly Val Val Gly Ser Gly Glu Leu Gly Asp Pro Gly Tyr Trp
3410 3415 3420

Val Arg His Ala Arg Glu Ala Val Arg Phe Ala Asp Gly Val Gly Val
3425 3430 3435 3440

Val Arg Gly Leu Gly Val Gly Thr Leu Val Glu Val Gly Pro His Gly
3445 3450 3455

Val Leu Thr Gly Met Ala Gly Gln Cys Leu Glu Ala Gly Asp Asp Val
3460 3465 3470

Val Val Val Pro Ala Met Arg Arg Gly Arg Pro Glu Arg Glu Val Phe
3475 3480 3485

Glu Ala Ala Leu Ala Thr Val Phe Thr Arg Asp Ala Gly Leu Asp Ala
3490 3495 3500

Thr Thr Leu His Thr Gly Ser Thr Gly Arg Arg Ile Asp Leu Pro Thr

3505 3510 3515 3520

Tyr Pro Phe Gln His Asn Arg Tyr Trp Ala Thr Gly Ser Val Thr Gly
3525 3530 3535

Ala Thr Gly Thr Ser Ala Ala Ala Arg Phe Gly Leu Glu Trp Lys Asp
3540 3545 3550

His Pro Phe Leu Ser Gly Ala Thr Pro Ile Ala Gly Ser Gly Ala Leu
3555 3560 3565

Leu Leu Thr Gly Arg Val Gly Leu Ala Ala His Pro Trp Leu Ala Asp
3570 3575 3580

His Ala Ile Ser Gly Thr Val Leu Leu Pro Gly Thr Ala Ile Ala Asp
3585 3590 3595 3600

Leu Leu Leu Arg Ala Val Glu Glu Val Gly Ala Gly Gly Val Glu Glu
3605 3610 3615

Leu Thr Leu His Glu Pro Leu Leu Leu Pro Glu Arg Gly Gly Leu His
3620 3625 3630

Val Gln Val Leu Val Glu Ala Ala Asp Glu Gln Gly Arg Arg Ala Val
3635 3640 3645

Ala Val Ala Ala Arg Pro Glu Gly Pro Gly Arg Asp Gly Glu Glu Gln
3650 3655 3660

Glu Trp Thr Arg His Ala Glu Gly Val Leu Thr Ser Thr Glu Thr Ala
3665 3670 3675 3680

Val Pro Asp Met Gly Trp Ala Ala Gly Ala Trp Pro Pro Pro Gly Ala
3685 3690 3695

Glu Pro Ile Asp Val Glu Glu Leu Tyr Asp Ala Phe Ala Ala Asp Gly
3700 3705 3710

Tyr Gly Tyr Gly Pro Ala Phe Thr Ala Leu Ser Gly Val Trp Arg Leu
3715 3720 3725

Gly Asp Glu Leu Phe Ala Glu Val Arg Arg Pro Ala Gly Gly Ala Gly
3730 3735 3740

Thr Thr Gly Asp Gly Phe Gly Val His Pro Ala Leu Phe Asp Ala Ala
3745 3750 3755 3760

Leu His Pro Trp Arg Ala Gly Gly Leu Leu Pro Asp Thr Gly Gly Thr
3765 3770 3775

Thr Trp Ala Pro Phe Ser Trp Gln Gly Ile Ala Leu His Thr Thr Gly
3780 3785 3790

Ala Glu Thr Leu Arg Val Arg Leu Ala Pro Ala Ala Gly Gly Thr Glu
3795 3800 3805

Ser Ala Phe Ser Val Gln Ala Ala Asp Pro Ala Gly Thr Pro Val Leu
3810 3815 3820

Thr Leu Asp Ala Leu Leu Leu Arg Pro Val Thr Leu Gly Arg Ala Asp

3825 3830 3835 3840

Ala Pro Gln Pro Leu Tyr Arg Val Asp Trp Gln Pro Val Gly Gln Gly
3845 3850 3855

Thr Glu Ala Ser Gly Ala Gln Gly Trp Thr Val Leu Gly Gln Ala Ala
3860 3865 3870

Ala Glu Thr Val Ala Gln Pro Ala Ala His Ala Asp Leu Thr Ala Leu
3875 3880 3885

Arg Thr Ala Val Ala Ala Ala Gly Thr Pro Val Pro Arg Leu Val Val
3890 3895 3900

Val Ser Pro Val Asp Thr Arg Leu Asp Glu Gly Pro Val Leu Ala Asp
3905 3910 3915 3920

Ala Glu Ala Arg Ala Arg Ala Gly Asp Gly Trp Asp Asp Asp Pro Leu
3925 3930 3935

Arg Val Ala Leu Gly Arg Gly Leu Thr Leu Val Arg Glu Trp Val Glu
3940 3945 3950

Asp Glu Arg Leu Ala Asp Ser Arg Leu Val Val Leu Thr Arg Gly Ala
3955 3960 3965

Val Ala Ala Gly Pro Gly Asp Val Pro Asp Leu Thr Gly Ala Ala Leu
3970 3975 3980

Trp Gly Leu Leu Arg Ser Ala Gln Ser Glu Tyr Pro Asp Arg Phe Thr
3985 3990 3995 4000

Leu Ile Asp Val Asp Asp Ser Pro Glu Ser Arg Ala Ala Leu Pro Arg
4005 4010 4015

Ala Leu Gly Ser Ala Glu Arg Gln Leu Ala Leu Arg Thr Gly Asp Val
4020 4025 4030

Leu Ala Pro Ala Leu Val Pro Met Ala Thr Arg Pro Ala Glu Thr Thr
4035 4040 4045

Pro Ala Thr Ala Val Ala Ser Ala Thr Thr Gln Thr Gln Val Thr Ala
4050 4055 4060

Pro Ala Pro Asp Asp Pro Ala Ala Asp Ala Val Phe Asp Pro Ala Gly
4065 4070 4075 4080

Thr Val Leu Ile Thr Gly Gly Thr Gly Ala Leu Gly Arg Arg Val Ala
4085 4090 4095

Ser His Leu Ala Arg Arg Tyr Gly Val Arg His Met Leu Leu Val Ser
4100 4105 4110

Arg Arg Gly Pro Asp Ala Pro Glu Ala Gly Pro Leu Glu Arg Glu Leu
4115 4120 4125

Ala Gly Leu Gly Val Thr Ala Thr Phe Leu Ala Cys Asp Leu Thr Asp
4130 4135 4140

Ile Glu Ala Val Arg Lys Ala Val Ala Ala Val Pro Ser Asp His Pro

4145 4150 4155 4160

Leu Thr Gly Val Val His Thr Ala Gly Val Leu Asp Asp Gly Ala Leu
4165 4170 4175

Thr Gly Leu Thr Arg Gln Arg Leu Asp Thr Val Leu Arg Pro Lys Ala
4180 4185 4190

Asp Ala Val Arg Asn Leu His Glu Ala Thr Leu Asp Arg Pro Leu Arg
4195 4200 4205

Ala Phe Val Leu Phe Ser Ala Ala Ala Gly Leu Leu Gly Arg Pro Gly
4210 4215 4220

Gln Ala Ser Tyr Ala Ala Ala Asn Ala Val Leu Asp Ala Leu Ala Gly
4225 4230 4235 4240

Ala Arg Arg Ala Ala Gly Leu Pro Ala Val Ser Leu Ala Trp Gly Leu
4245 4250 4255

Trp Asp Glu Gln Thr Gly Met Ala Gly Gly Leu Asp Glu Met Ala Leu
4260 4265 4270

Arg Val Leu Arg Arg Asp Gly Ile Ala Ala Met Pro Pro Glu Gln Gly
4275 4280 4285

Leu Glu Leu Leu Asp Leu Ala Leu Thr Gly His Arg Asp Gly Pro Ala
4290 4295 4300

```
Val Leu Val Pro Leu Leu Leu Asp Gly Ala Ala Leu Arg Arg Thr Ala
4305                4310                4315                4320

Lys Glu Arg Gly Ala Ala Thr Met Ser Pro Leu Leu Arg Ala Leu Leu
                    4325                4330                4335

Pro Ala Ala Leu Arg Arg Ser Gly Gly Ala Gly Ala Pro Ala Ala Ala
            4340                4345                4350

Asp Arg His Gly Lys Glu Ala Asp Pro Gly Ala Gly Arg Leu Ala Gly
        4355                4360                4365

Met Val Ala Leu Glu Ala Ala Glu Arg Ser Ala Ala Val Leu Glu Leu
    4370                4375                4380

Val Thr Glu Gln Val Ala Glu Val Leu Gly Tyr Ala Ser Ala Ala Glu
4385                4390                4395                4400

Ile Glu Pro Glu Arg Pro Phe Arg Glu Ile Gly Val Asp Ser Leu Ala
                    4405                4410                4415

Ala Val Glu Leu Arg Asn Arg Leu Ser Arg Leu Val Gly Leu Arg Leu
            4420                4425                4430

Pro Thr Thr Leu Ser Phe Asp His Pro Thr Pro Lys Asp Met Ala Gln
        4435                4440                4445

His Ile Asp Gly Gln Leu Pro Arg Pro Ala Gly Ala Ser Pro Ala Asp
    4450                4455                4460

Ala Ala Leu Glu Gly Ile Gly Asp Leu Ala Arg Ala Val Ala Leu Leu
4465                4470                4475                4480

Gly Thr Gly Asp Ala Arg Arg Ala Glu Val Arg Glu Gln Leu Val Gly
                    4485                4490                4495

Leu Leu Ala Ala Leu Asp Pro Pro Gly Arg Thr Gly Thr Ala Ala Pro
            4500                4505                4510

Gly Val Pro Ser Gly Ala Asp Gly Ala Glu Pro Thr Val Thr Asp Arg
        4515                4520                4525

Leu Asp Glu Ala Thr Asp Asp Glu Ile Phe Ala Phe Leu Asp Glu Gln
    4530                4535                4540

Leu  *
4545
```

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

CGAGGCCGGC GGGCC

Claims

1. A DNA molecule comprising an isolated DNA sequence that encodes a tylactone synthase domain.

2. The DNA molecule as claimed in Claim 1 wherein the isolated DNA sequence is selected from the group consisting of:
nucleotides 942 to 2156, 2571 to 3557, 3675 to 3929, 3993 to 5264, 5631 to 6617, 7410 to 7949, 8220 to 8471, 8541 to 9812, 10260 to 11246, 11319 to 11876, 12861 to 13415, 13719 to 13970, 14411 to 15697, 16055 to 17122, 17198 to 17794, 18584 to 19138, 19415 to 19666, 20136 to 21404, 21771 to 22757, 23541 to 24077, 24360 to 24611, 24675 to 25949, 26292 to 27284, 27360 to 27917, 28767 to 29813, 29829 to 30368, 30651 to 30902, 31337 to 32608, 32975 to 33961, 34694 to 35236, 35492 to 35743, 36360 to 37631, 37989 to 38987, 39759 to 40313, 40575 to 40826, and 41235 to 41333 all in SEQ ID NO:1.

3. The DNA molecule as claimed in Claim 1 wherein the isolated DNA sequence is selected from the group consisting of:
nucleotides 942 to 8471, 8541 to 13970, 14411 to 19666, 20136 to 24611, 24675 to 30902, 31337 to 35743, and 36360 to 40826 all in SEQ ID NO:1.

4. The DNA molecule as claimed in Claim 1 wherein the isolated DNA sequence is selected from the group consisting of:
nucleotides 816 to 14234, 14351 to 19945, 20010 to 31199, 31232 to 36067, and 36249 to 41774 all in SEQ ID NO:1.

5. The DNA molecule as claimed in Claim 1 wherein the isolated DNA sequence is SEQ ID NO:1.

6. A polypeptide comprising an amino acid sequence that consists of a tylactone synthase domain.

7. The polypeptide of claim 6 wherein the amino acid sequence is selected from the group consisting of:

(a) amino acids 43 to 447, 586 to 914, 954 to 1038, 1060 to 1483, 1606 to 1934, 2199 to 2378, 2469 to 2552, 2576 to 2999, 3149 to 3477, 3502 to 3687, 4016 to 4200, and 4302 to 4385 in SEQ ID NO:2;
(b) amino acids 21 to 449, 569 to 924, 950 to 1148, 1412 to 1596, and 1689 to 1772 in SEQ ID NO:3;
(c) amino acids 43 to 465, 588 to 916, 1178 to 1356, and 1451 to 1534, 1556 to 1980, 2095 to 2425, 2451 to 2636, 3274 to 3453, and 3548 to 3631 in SEQ ID NO:4;
(d) amino acids 36 to 459, 582 to 910, 1155 to 1335, and 1421 to 1504 in SEQ ID NO:5; and
(e) amino acids 38 to 461, 581 to 913, 1171 to 1355, 1443 to 1526, and 1663 to 1695 in SEQ ID NO:6.

8. The polypeptide of claim 6 wherein the amino acid sequence is selected from the group consisting of:

(a) amino acids 1060 to 2552 and 2576 to 4385 in SEQ ID NO:2;
(b) amino acids 21 to 1772 in SEQ ID NO:3;

(c) amino acids 43 to 1534 and 1556 to 3631 in SEQ ID NO:4;
(d) amino acids 36 to 1504 in SEQ ID NO:5; and
(e) amino acids 38 to 1526 in SEQ ID NO:6.

9. The polypeptide of claim 6 wherein the amino acid sequence is selected from the group consisting of SEQ ID NO: 2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, and SEQ ID NO:6.

10. A recombinant DNA vector comprising a DNA molecule of Claim 1.

11. A recombinant DNA vector comprising a DNA molecule of Claim 2.

12. A recombinant DNA vector comprising a DNA molecule of Claim 3.

13. A recombinant DNA vector comprising a DNA molecule of Claim 4.

14. A recombinant DNA vector comprising a DNA molecule of Claim 5.

15. A recombinant DNA vector of Claim 10 which is NRRL B-18688.

16. A recombinant DNA vector of Claim 10 which is NRRL B-18689

17. A host cell transformed with a recombinant DNA vector of Claim 10.

18. A host cell transformed with a recombinant DNA vector of Claim 11.

19. A host cell transformed with a recombinant DNA vector of Claim 12.

20. A host cell transformed with a recombinant DNA vector of Claim 13.

21. A host cell transformed with a recombinant DNA vector of Claim 14.

22. The DNA molecule as claimed in Claim 1 wherein the isolated DNA sequence is SEQ ID NO:7.

23. The polypeptide of SEQ ID NO:8.

Fig. 1

tylG ~43 kb
KS' AT ACP KS-1 AT KR ACP KS-2 AT DH KR ACP
ORF1
KS-3 AT DH KR ACP
ORF2
KS-4 AT KR' ACP KS-5 AT DH ER KR ACP
ORF3
KS-6 AT KR ACP
ORF4
KS-7 AT KR ACP TE
ORF5
Starter Module
Module 1
Module 2
Module 3
Module 4
Module 5
Module 6
Module 7

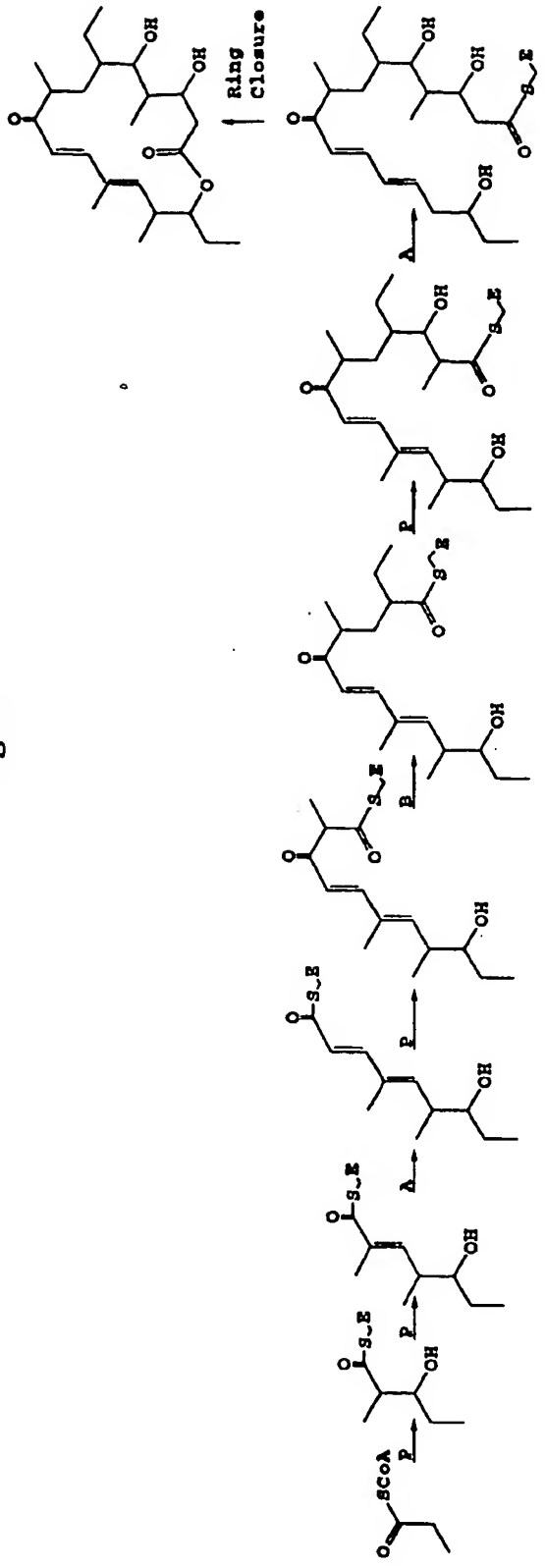


Fig. 2

Fig. 3

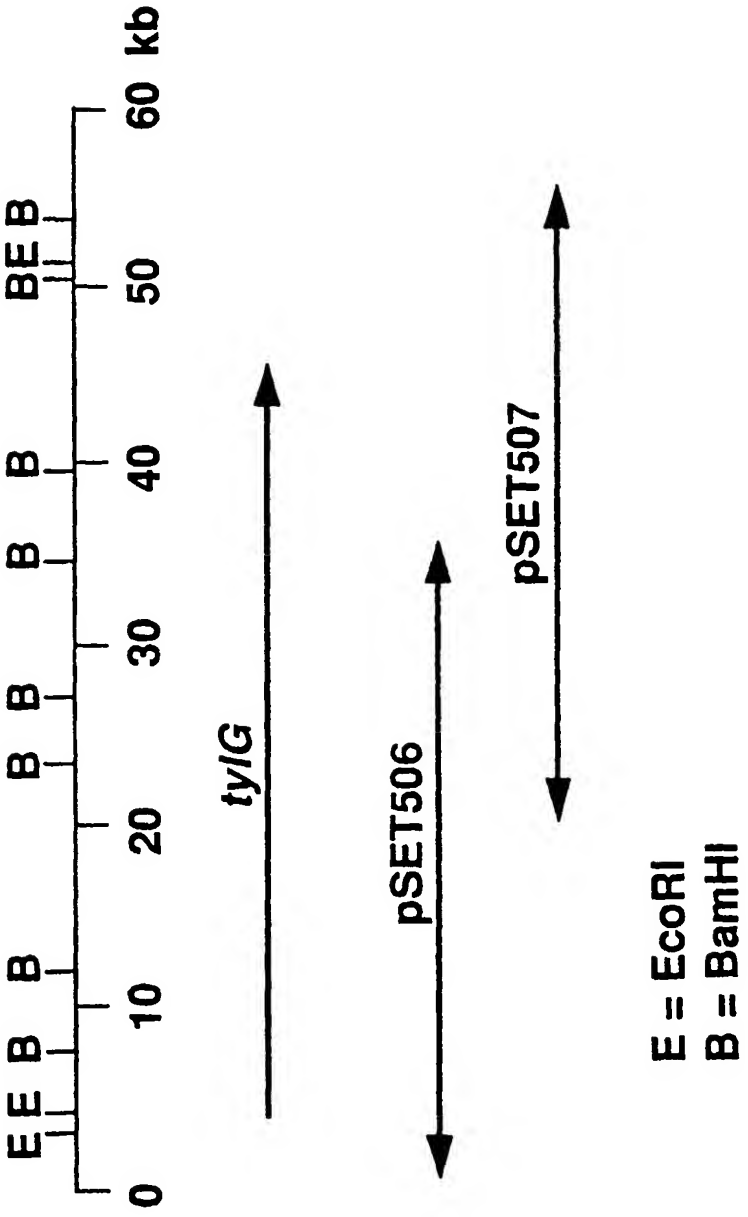

0
10
20
30
40
50
60 kb
E E B B B B B B E B
tylG
pSET506
pSET507
E = EcoRI
B = BamHI

Fig. 4

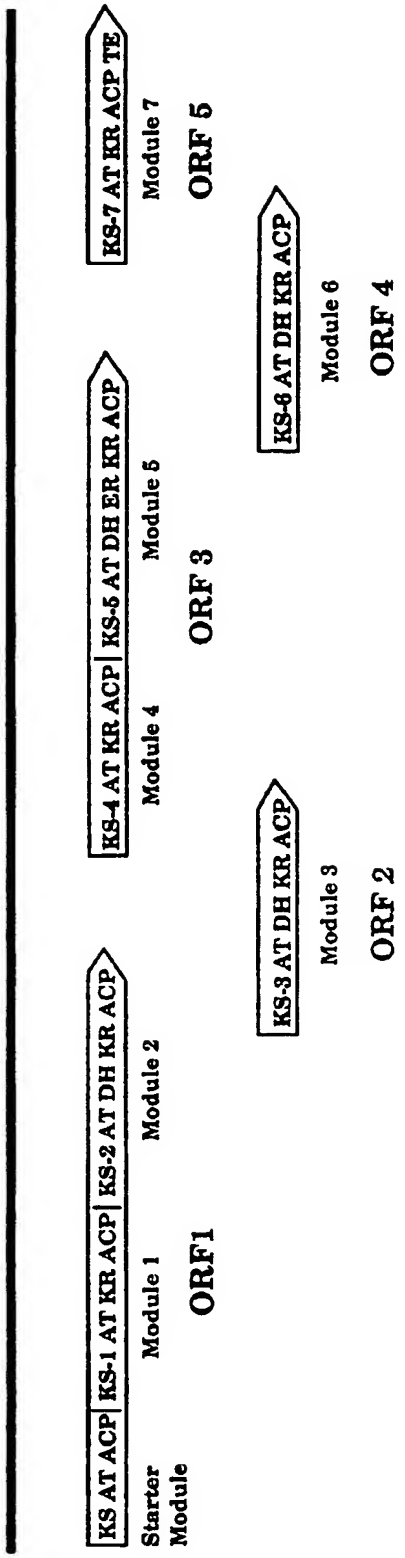

srmG ~44kb
KS AT ACP
KS-1 AT KR ACP
KS-2 AT DH KR ACP
Starter Module
Module 1
Module 2
ORF1
KS-3 AT DH KR ACP
Module 3
ORF 2
KS-4 AT KR ACP
KS-5 AT DH ER KR ACP
Module 4
Module 5
ORF 3
KS-6 AT DH KR ACP
Module 6
ORF 4
KS-7 AT KR ACP TE
Module 7
ORF 5

Fig. 5

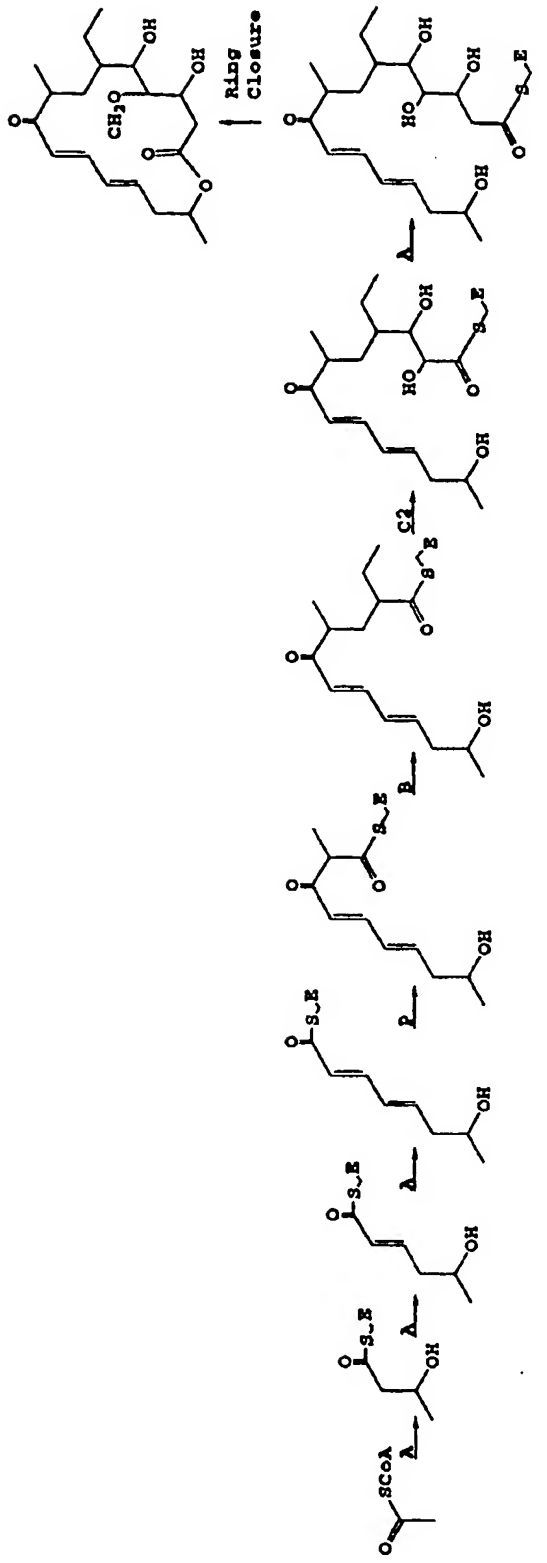
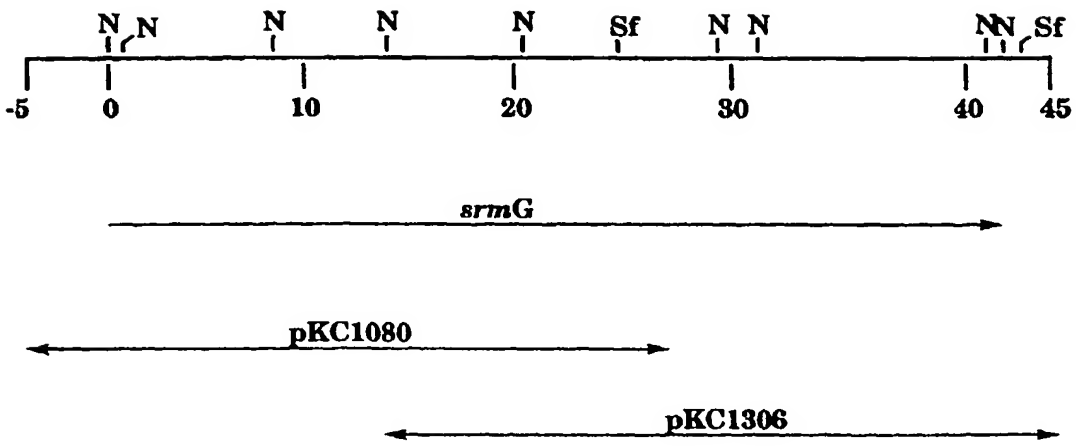


Fig. 6



N = *Nru*I

Sf = *Sfu*I

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